

# Chapter 4 — Environmental Consequences

## Introduction

This chapter analyzes the environmental impacts that are projected to occur as a result of implementing land management actions described for each alternative. The baseline used for project impacts is the current condition described in Chapter 2—Affected Environment. Impacts are projected for the short term (0 to 10 years unless otherwise noted) and for the long term (10 to 20 years).

Each of the resource management activities that could impact other resource values are analyzed by program. There are some programs that would have the same impact across all alternatives, or would have little or no effect and do not need further analysis. The analysis for each alternative is presented by resource and organized into four sections:

**Management Goal:** These are defined in Chapter 3 and would be the same for each alternative.

**Analysis of Impacts:** This is a description of the possible impacts, both beneficial and adverse, from a proposed land use allocation or management action. The impact or change is compared to the current management situation, Alternative A. For ease of reading, the analysis shown in Alternative A may be referenced in following alternative impact discussions with such statements as, “. . . impacts would be the same as Alternative A. . .,” or “. . . impacts would be the same as Alternative A, except for . . .,” as applicable.

**Summary:** At the end of each resource discussion is a summary comparison of impacts for each alternative, describing how well it meets the management goal.

**Secondary, Indirect, and Cumulative Impacts:** The final section under each resource discussion is a description of secondary, indirect, and cumulative impacts of the past, present, and reasonably-foreseeable future actions for each alternative. This section also considers impacts of other agency actions, as well as actions on private land within or adjacent to the planning area.

## Assumptions

Several general assumptions were made to facilitate the analysis of potential impacts. The assumptions listed

below are common to all alternatives. Other assumptions specific to a particular resource are listed under that resource.

- Changes in Bureau of Land Management (BLM) policies have been made since the current land use plans were approved. This includes such things as the “Standards for Rangeland Health and Guidelines for Livestock Grazing Management” (USDI-BLM 1997a).
- All alternatives would maintain the vegetation resource and meet needs for water, nutrient, and energy cycling.
- Funding and personnel would be sufficient to implement any alternative described and would be the same across all alternatives.
- Monitoring studies would be completed as indicated, and adjustments or revisions would be made as described in the Adaptive Management section of Chapter 3.
- Appropriate maintenance would be carried out to maintain the functional capability of all developments (roads, fences, and other projects).
- The approved Resource Management Plan (RMP) would remain in effect for 15 to 20 years.

## Critical Elements of the Human Environment

The following critical elements of the human environment are addressed in Chapter 4, as required by the “National Environmental Policy Act” (NEPA): air quality, floodplains, cultural/paleontological resources, prime or unique farmlands, Native American religious concerns, threatened or endangered species, areas of critical environmental concern (ACEC’s), potential wild and scenic rivers (WSR’s), wilderness study areas (WSA’s), visual resources, water resources, and environmental justice. The alternatives call for varying degrees of resource use and protection. As a result, there are varying degrees or forms of protective management or mitigation for some of these resources or land use allocations. These critical elements will also be considered, as appropriate, in site-specific project NEPA analysis, design, and implementation.

## Plant Communities

### Shrub Steppe

**Management Goal 1—*Restore, protect, and enhance the diversity and distribution of desirable vegetation communities, including perennial native and desirable introduced plant species. Provide for their continued existence and normal function in nutrient, water, and energy cycles.***

**Management Goal 2—*Protect healthy, functioning ecosystems consisting of native plant communities. Restore degraded high-potential landscapes and decadent shrublands.***

#### *Assumptions*

Characteristics used to analyze the degree to which vegetation communities meet the desired range of conditions and thus, rangeland vegetation management objectives, are displayed in Figure 4-1.

Reduced vegetation structure and ground cover lead to increased soil erosion rates. Soil erosion rates on shrub steppe communities are highly dependent on the proportion of the soil surface protected from raindrop impact by vegetation. Erosion rates increase exponentially as plant cover decreases (Meeuwig 1970).

Prescribed burn treatments would create a mosaic pattern of islands and stringers and would maintain structure (connectivity) and desired diversity. Wildland fire may accomplish these patterns, but because of cheatgrass and exotic annuals, large, contiguous areas are often burned instead of a mosaic of burned and unburned areas.

The alternatives have the potential to affect vegetation in terms of the relative abundance of species within communities, the relative distribution of plant communities, and the relative occurrence of seral stages of those communities. However, implementation of any alternative would not result in the complete elimination of a plant species, plant community, or seral stage. Management actions would not intentionally eliminate a special status plant species.

#### *Analysis of Impacts*

##### Alternative A

Maintenance of vegetative composition of nonnative seedlings would ensure continued forage production.

Some stands of seeded nonnative perennial species would continue to be managed primarily for forage production and would make minimal progress toward supporting greater species or structural diversity. Connectivity of big sagebrush cover may be reduced. Implementation of vegetation manipulation projects must be consistent with existing management objectives.

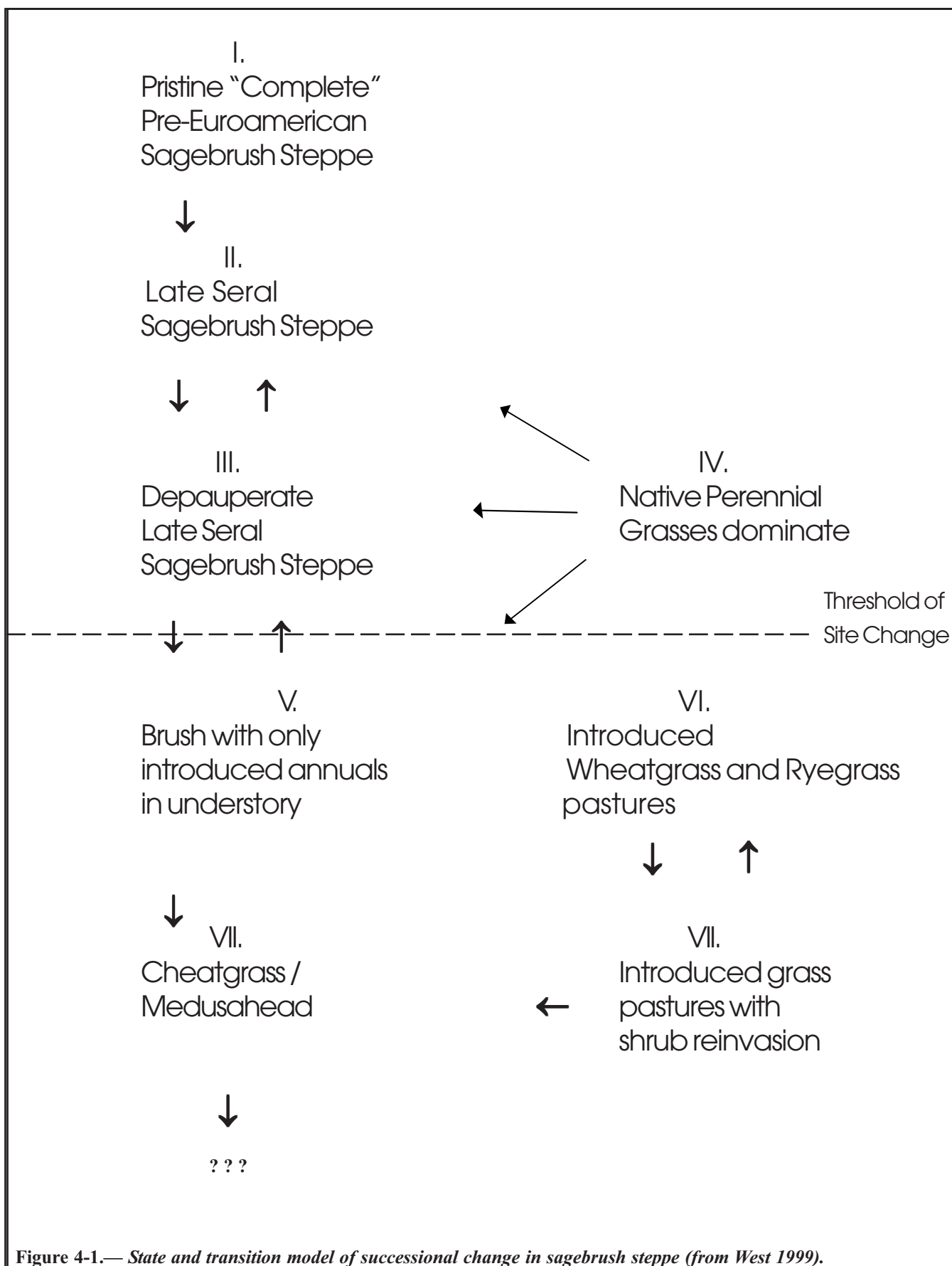
Integrated weed management actions would slow the spread of established stands of noxious weeds and reduce the establishment of new infestations.

Watershed improvements for both function and processes would maintain or enhance vegetation conditions in most cases. Water resource management activities would usually meet minimum construction standards, as would construction and maintenance of roads. There would be minimal or no damage to shrub steppe vegetation communities. If flooding occurs due to natural causes or related to construction, rehabilitation could be carried out swiftly and effectively. Commodity uses, including recreational use, off-highway vehicle (OHV) use, livestock production, mineral exploration, and other uses, would increase localized areas of soil disturbance and increase the mechanisms of seed dispersal, impacting sagebrush steppe communities.

The ecological condition of the shrub steppe community could be improved, and there could be an increase of forage production through the development and implementation of economically feasible grazing systems and range improvements. In areas such as the Beaty Butte allotment, not all of the animal unit months (AUM's) are utilized; however, livestock tend to concentrate in small areas around water sources, causing concentrated overutilization. Methods to move and disperse livestock would benefit the diversity and condition of the shrub steppe around such sites.

Carrying capacities and seasons of use for livestock in some areas would continue at a level that would provide for a diversity of seral stages of rangeland plant communities, while other areas would support the earlier seral stages of rangeland vegetation types resulting from localized problems in range management.

Disturbance associated with relatively high carrying capacities and long seasons of use for livestock would result in a landscape dominated by the low structural diversity (annual grasses and forbs) characteristic of the earlier seral stages of rangeland vegetation. The use of livestock grazing systems would have both



positive and negative impacts on vegetation, depending on the system and the vegetation community. The impacts of the different grazing systems on each vegetation community are described in Appendix E2 of the Draft RMP/Environmental Impact Statement (EIS). The grazing systems are described in Appendix E5.

The rest/rotation system is both the most common livestock grazing system in use in the resource area (56 percent of acres grazed) and also the system that would be expected to most improve key species composition. Therefore, the vegetation composition on over half of the resource area would potentially improve under this alternative. There are allotments that primarily use a rest/rotation system, but some pastures utilize other systems that may be more beneficial, such as spring grazing in a riparian pasture. For the purpose of this analysis, the positive impacts of this combination are recorded as part of the rest/rotation system because that system controls the largest acreage within the allotment. The key herbaceous vegetation composition would either be improved or maintained under the other five grazing systems; this accounts for 36 percent of the acres under a grazing system in the resource area. About one percent of the acreage in the resource area would show a short-term decrease in species composition as a result of being grazed under a spring/summer grazing system. This is due to the fact that forage species would be grazed during their growing season.

The spring/fall and deferred grazing systems could result in a decrease in palatable woody vegetation, such as willows, quaking aspen, and antelope bitterbrush. These grazing systems are found on about 4 percent of the acres that are grazed in the resource area. The difference in the alternatives is the rate at which the palatable woody species composition could decline. A summary of grazing impacts to key species vegetation by type of grazing system and season of use is shown in Table 4-1. Specific impacts of livestock grazing to the various plant communities by grazing system are discussed in Appendix E2 of the Draft RMP/EIS.

Wild horse management areas pose different problems and need to be kept at appropriate management levels in order to meet specific management (horses, wildlife, plant community health, livestock, and recreation) objectives. Where appropriate management levels are exceeded, or during drought, patches and larger areas of shrub steppe communities could be destroyed. Hoof disturbances along regular trails could cause long-lasting soil degradation and loss of water infiltration.

No new SMA's would be designated (ACEC's or

WSR's), thus eliminating the possibility of special protective management for new research natural areas (RNA's), Oregon Natural Heritage Program (ONHP) plant community cells (emphasizing shrub steppe), and BLM special status plant species habitats. The habitat management plan for the Black Hills area would continue to restrict OHV use, as would the emergency closures for Table Rock and South Green Mountain to protect BLM sensitive plant species.

Full suppression of wildland fire outside of the Fort Rock Fire Management Area would not allow for wildland fire use to improve resources. Use of prescribed fire would be on a case-by-case basis. Areas that are burned by wildland fire would be rehabilitated or revegetated to protect soil, water, and vegetation resources or to prevent unacceptable damage (such as introduction of noxious weeds and cheatgrass). Resting rehabilitated areas for a minimum of two growing seasons would allow vegetation to reestablish, allow litter to build up on the soil, and reduce erosion. Two seasons of rest could also make the disturbed area less susceptible to the invasion of noxious weeds.

The identification of plant communities considered "at risk" by the Interior Columbia Basin Ecosystem Management Project (ICBEMP) due to cultural values would require increased consultation with the Tribal people and awareness among resource specialists.

With most of the area accessible to OHV use, the potential for water channeling, vegetation removal, weed dispersal, and soil disturbance would increase. A moderate increase in localized impacts would result within areas currently used for recreation.

Exploration, development, and production of minerals could cause changes in species composition and relative abundance of species, despite preparation of plans of operation. Even after reclamation efforts, it would be unlikely that environmental conditions supporting the predisturbance plant community would be restored. The scale of these effects would vary across the alternatives as larger areas would have either surface restrictions on energy and mineral exploration and development or no-surface-occupancy stipulations. Mitigation measures would be included in plan of operations. Soils could be stockpiled for future reclamation and native seeds could be gathered and grown for future seed sources from the site.

New road construction, road maintenance, and right-of-way use to support commodity-related activities would minimally increase vegetation impacts. Long-term impacts from roads and rights-of-way would be mini-

**Table 4-1.—Livestock grazing impacts to key species vegetation by type of grazing system and season of use**

Type of grazing	Alternative			
	A	B	C	D
Winter	Would improve or maintain key species composition because of dormant season grazing.	Same as Alternative A, except composition of palatable woody vegetation would decrease.	Same as Alternative A.	Same as Alternative A.
Spring	Would improve or maintain key species composition as plants have time and soil moisture to reach full growth, produce seed, and replenish reserves.	Would maintain key species composition as plants have time and soil moisture to reach full growth, produce seed, and replenish reserves.	Same as Alternative A.	Same as Alternative A.
Spring/summer	About 60% of acres would have decreases in key species composition—this results from continuous heavy use in concentration areas such water sources, fences, and bottom lands.	About 66% of acres would have decreases in key species composition—this results from continuous heavy use in concentration areas such water sources, fences, and bottom lands.	About 48% acres would have decreases in key species composition—this results from continuous heavy use in concentration areas such water sources, fences, and bottom lands.	Same as Alternative A.
Spring/fall	Would only maintain existing key herbaceous species composition; composition of palatable woody vegetation would decrease.	Same as Alternative A, except the loss of palatable woody species would be accelerated.	Same as Alternative A, except the loss of palatable woody species would be at a slower rate.	Same as Alternative A.
Deferred	Would improve or maintain key herbaceous species composition because of dormant season grazing; composition of palatable woody vegetation <u>may</u> decrease.	Same as Alternative A, except the loss of palatable woody species would be accelerated.	Same as Alternative A, except <u>any</u> loss of palatable woody species would be at a slower rate.	Same as Alternative A.

Type of grazing	Alternative			
	A	B	C	D
Deferred rotation	Would only maintain existing key species composition.	Same as Alternative A, except the composition of palatable woody vegetation <u>may</u> decrease.	Same as Alternative A.	Same as Alternative A.
Rest rotation	Would significantly improve the composition of key species. System has the advantage of grazing rotation and provides a yearlong rest which promotes seed production, root growth, plant vigor, and litter accumulation.	Would only improve or maintain the composition of key species.	Same as Alternative A.	Same as Alternative A.

mized with best management practices (BMP's). Short-term impacts would occur until disturbed surfaces were contoured and revegetated.

#### **Alternative B**

Upland native shrub steppe communities would be managed to attain a trend toward desired range of conditions based on site potential. Management actions would be for maintenance of the condition where vegetation composition and structure were consistent with desired conditions. Forage production and other commodity values of native and nonnative vegetation resources would be optimized.

Impacts to shrub species would be similar to those identified in Alternative A. Connectivity of big sagebrush cover would be maintained in native vegetation communities that provide important wildlife habitat.

Impacts resulting from vegetation manipulation, primarily seedings, would be similar to those identified in Alternative A; however, more use of nonnative species might be employed. This might ensure seeding success but would provide less diversity. Some stands of seeded nonnative perennial species would continue to be managed primarily for forage production, so connectivity of big sagebrush cover may be reduced.

Weed management would have impacts similar to those identified in Alternative A.

Management of special status plant, fish, and wildlife species would have the same impacts as identified in Alternative A.

Impacts from livestock management actions would be similar to those identified in Alternative A. As a result of optimizing livestock use of available forage, the benefits of returning vegetation material to the soil would be minimized. Long-term vigor and health of vegetation communities could be maintained across the landscape, except at localized areas of concentrated activity. About one percent of the acreage in the resource area would show a short-term decrease in species composition as a result of spring/summer livestock grazing during the growing season. In the long term, impacts of spring/summer grazing would be reduced significantly when replaced by spring, deferred, deferred rotation, or rest/rotation grazing systems. The grazing system or combination of systems best suited to replace spring/summer grazing would be determined by allotment, depending on the vegetation and the multiple use objectives for that allotment. In the long term, there would be less than one percent of the resource area under spring/summer grazing under Alternative B.

The spring/fall and deferred grazing systems may result in a decrease in palatable woody vegetation, such as willows, quaking aspen, and antelope bitterbrush. The rate of decline would be faster under this alternative than under Alternative A. A summary of grazing

impacts to key species vegetation by type of grazing system and season of use is shown in Table 4-1. Specific impacts of livestock grazing to the various plant communities by grazing system are fully discussed in Appendix E2 of the Draft RMP/EIS.

Impacts from wild horse management would be as described in Alternative A, except impacts would increase due to greater horse numbers in both the Beaty Butte and Paisley Herd Management Areas. Wild horse use of an area is much more widespread than livestock use; horses use hilltops, ridgelines, and other areas. They also concentrate around water holes or running water and have been known to dig up areas in canyon bottoms where water is running below the surface. Several factors play into the equation for wild horse management: the herd numbers, forage AUM's for the horses, and how frequently herds are gathered. The net result would be an increase in horse impacts on sagebrush steppe plant communities in the Paisley Desert and Beaty Butte Herd Management Areas. Hoof disturbances along regular trails and territories would be long-lasting and could lead to soil degradation and loss of water infiltration.

Impacts to vegetation from new project construction would be similar to those identified in Alternative A, though more projects could be constructed.

Management of wildland fire and prescribed fire would have impacts similar to those identified in Alternative A; however, treatment configuration of prescribed burns would emphasize commodity production such as livestock forage, as opposed to mosaics, which benefit wildlife.

Impacts from recreation use would be similar to those identified in Alternative A, except there would be more development of roads, trails, and campgrounds, and less emphasis on dispersed recreation. Recreation use would be more concentrated; therefore, the impacts of visitor use (such as vegetation trampling and removal) would be more concentrated. Impacts from OHV use would be of the same type identified in Alternative A, but fewer acres would be designated open (Tables 3-5 and 4-5).

The impacts from mineral exploration or development would be similar to those identified in Alternative A, except the acreage of high mineral potential land remaining available for exploration and development would be highest under this alternative.

New road construction, road maintenance, and right-of-way use to support commodity-related activities would

be similar to Alternative A, but of greater magnitude.

### **Alternative C**

The ecological condition of the shrub steppe community could be improved with the emphasis on diversifying composition and structure of vegetation.

Nonnative seedlings would change over time by allowing natural establishment of native shrubs and grasses, and in some cases may be actively rehabilitated by use of prescribed fire or physical manipulation to native seedlings, especially where mosaic plant communities are desired. Large nonnative seedlings could be broken up into mosaics of native vegetation using greenstripping. These actions would support the progress toward greater species and/or structural diversity. Connectivity of big sagebrush cover would be encouraged, especially in greater sage-grouse nesting areas.

With the aid of rehabilitation, less livestock grazing, and the use of prescribed fire, this alternative would generally reduce dominance by woody species, such as juniper and bitterbrush, and would increase mosaics of diverse structures of multiple-aged shrubs, forbs, and perennial grasses. This would result in greater productivity and improved natural functions and watershed stability. Shrub reintroduction into burned sites would maintain diversity at a moderate scale, especially within habitat of sagebrush-dependent wildlife species.

Watershed improvement for both function and processes would enhance vegetation conditions in most cases. Water resource management activities, as well as construction and maintenance of roads, would not have a negative effect on plant communities if they met minimum construction standards. In some cases, actions such as check dams (to slow down overland flow) would be beneficial to the shrub steppe community.

Proactive management is needed to prevent unnaturally large and/or frequent wildland fires in areas where fuel buildup or exotic annual grass invasions have occurred. Such management actions may include altering grazing regimes to prevent annual plant invasions (such as spring rest/rotation in seedlings), prescribed fire to prevent fuel buildup (especially to reduce high woody vegetation densities), brush beating to release forbs and grasses and to reduce shrub densities, and/or restricting OHV use.

Areas that are burned by wildland fire would be rehabilitated or revegetated to protect vegetation

resources and to prevent introduction of noxious weeds and cheatgrass. Livestock use of burned areas would be deferred for a minimum of two years following rehabilitation. This would allow the desired vegetation to become established and litter accumulation to have recovered to levels that are adequate to support and protect plant community functions.

The impacts of livestock management actions would be similar to Alternative A. However, there would be 20 percent fewer AUM's and no authorized temporary nonrenewable grazing use. Appropriate grazing could retain adequate plant litter to maintain soil productivity and limit accelerated erosion, but with lower utilization levels, progress toward attaining desired range of conditions would be accelerated. Less fencing and water development would open new areas for grazing but would require more activity in moving livestock away from existing water resources. Long-term vigor and health of vegetation communities, which includes maintenance of soil stability and energy, nutrient, and water cycling, would be maintained across the landscape, except at small, localized areas of livestock concentrations. Much of the reduced grazing pressures would be within proposed ACEC's and would help protect and enhance the biodiversity of these plant community cells.

The vegetation composition on areas under rest/rotation grazing systems (56 percent of the area grazed) would improve under this alternative. The spring/fall and deferred grazing systems may result in a decrease in palatable woody vegetation, such as willows, quaking aspen, and antelope bitterbrush. These grazing systems are found on about 4 percent of the acres that are grazed in the resource area. Decline would be slowest under this alternative. Also, there may be a decline in palatable woody species under winter and deferred rotation grazing that would not occur in the other alternatives.

About one percent of the acres in the resource area would have a decrease in species composition under the spring/summer grazing system. These impacts would be short term or as long as the spring/summer grazing systems were still in effect. The long-term impacts of spring/summer grazing would be reduced significantly, as this system would be replaced by spring, deferred, deferred rotation, or rest/rotation grazing systems. The grazing system or combination of systems best suited to replace spring/summer grazing would be determined by allotment, depending on the vegetation and the multiple use objectives for that allotment. In the long term, less than one percent of the resource area would be under spring/summer

grazing in this alternative.

A summary of grazing impacts to key species vegetation by type of grazing system and season of use is shown in Table 4-1. Specific impacts of livestock grazing to the various plant communities by grazing system are fully discussed in Appendix E2 of the Draft RMP/EIS.

Wild horse impacts would be similar to Alternative B.

Livestock forage production and range improvements would be reduced. Construction of fewer new range-land projects would limit impacts to vegetation and would allow for recovery of heavily used areas around water sources.

This alternative proposes a significant increase in SMA's: 12 new ACEC's, 1 existing ACEC expansion, and 1 new WSR. These designations require special management to protect the natural resources, especially those that overlap RNA's. This special management would protect native plant communities from other uses and allow those communities to reach their potential, especially those designated as plant community "cells" by the ONHP. Among these cells are 12 examples of sagebrush steppe communities. These designations would give priority management attention to the areas.

Recreation would emphasize dispersed camping and recreational use and undeveloped types of recreation, thereby lessening the magnitude of impacts. At the same time, dispersed recreation use is difficult to control. Support facilities and interpretation of natural and cultural values would help develop a conservation ethic for the recreational users. Rehabilitation or closure of recreation sites where other resource values are being jeopardized would help restore plant community diversity and structure.

Impacts from OHV use would be the same types as identified in Alternative A, but of much less magnitude because none of the area would have an open designation. There would be a 79 percent increase in limited and closed designations. This would allow more control over the use of OHV's and would significantly lower the associated negative impacts.

The impacts from mineral exploration or development would be similar to those identified in Alternative A; however, this alternative would be the most restrictive. The withdrawal of the proposed Red Knoll ACEC from mining would have a positive influence on maintaining the naturalness of the sagebrush steppe and the cultural

plant values of this area.

Rights-of-way and pipelines would have the least negative impact of all the alternatives. Nominal corridor width would be half the size proposed in Alternative B, thus reducing the amount of physical disturbance to plant communities associated with these actions. The few actions involving legal public or administrative access would be limited and generally of little impact; however, where new roads are constructed, BMP's would be implemented (Appendix D).

#### **Alternative D**

This alternative is a balance between Alternatives A and C, so that natural values would be protected and improved while providing some commodity production. Many vegetation communities would progress toward a reduced dominance by woody species and an increased mosaic of multiple-aged shrubs, forbs, and perennial grasses (both native and introduced species). Long-term vigor and health of the vegetation communities, which include maintenance of soil stability and energy, nutrient, and water cycling, would be maintained across the landscape, except in localized areas of concentrated activity and in degraded communities of weeds/cheatgrass or shrub-invaded crested wheatgrass seedings. Shrub reintroduction into rehabilitated burned sites would maintain diversity at most scales. All acreage seeded would receive native seed mixtures and in some areas, introduce adapted perennial grasses.

Impacts from vegetation manipulation, primarily seedings, would be similar to those in Alternative A. Use of a mixture of native and introduced species would maintain some diversity and some degree of seeding success. The chances of establishment of mixed seedings on marginal sites and during poor climatic conditions would be higher than using all native species. This alternative would support establishment of desirable perennial cover in sites currently dominated by sagebrush, annual species, and western juniper. However, the long-term goal would be to support biodiverse and sustainable plant communities.

Management of special status plant species would have the same impacts as those identified in Alternative C due to the number of existing and new SMA's being proposed to protect and enhance special status plant species. The ACEC/RNA's being proposed would preserve plant community cells identified by the ONHP and would protect plants and other resource values not currently being protected under Alternative A.

Livestock forage (AUM's) would not change. Tempo-

rary nonrenewable grazing use would be allowed when it did not conflict with other resource values, uses, or objectives. Administrative solutions (seasons of use, stocking levels, etc.) would attempt to maintain other resource values for multiple use and sustainability. The impacts would be similar to Alternative A. Compared to Alternative C, plant litter would be less available for incorporation into soils, biological crusts would be less, and soils would be less protected from erosive overland flow.

The vegetation composition on areas under rest/rotation grazing systems (56 percent of the area grazed) would improve. The spring/fall and deferred grazing systems may result in a decrease in palatable woody vegetation, such as willows, quaking aspen, and antelope bitterbrush. These grazing systems are found on about 4 percent of the acres that are grazed. Rate of decline would be the same as under Alternative A. About one percent of the acres in the resource area would have a decrease in species composition under the spring/summer grazing system. These impacts would be short term or as long as the spring/summer grazing systems are still in effect. The long-term impacts of spring/summer grazing would be reduced significantly, as this system would be replaced by spring, deferred, deferred rotation, or rest/rotation grazing systems. The grazing system or combination of systems best suited to replace spring/summer grazing would be determined by allotment, depending on the existing vegetation and the multiple use objectives for that allotment. In the long term, there would be less than one percent of the resource area under spring/summer grazing. A summary of grazing impacts to key species vegetation by type of grazing system and season of use is shown in Table 4-1. Specific impacts of livestock grazing to the various plant communities by grazing system are discussed in Appendix E2 of the Draft RMP/EIS.

Wild horse impacts would be similar to Alternative B.

Impacts to vegetation from new project construction would be similar to those identified in Alternative A.

Management of wildland fire and prescribed fire would have impacts similar to those identified in Alternative A.

Impacts from undeveloped recreational opportunities would be similar to those identified in Alternative C, but there would be less emphasis on undeveloped, dispersed recreation. There would be more emphasis on establishing new recreation sites and developing tourism opportunities. The specific effects on the

plant communities would depend on where these activities take place. Areas open to OHV use would be smaller than Alternative A; limited and closed OHV designations would be greater than Alternative A. This alternative allows for more concentration of recreational activities, therefore increasing the accumulated negative effects. The increase of closed roads would mitigate those effects in ACEC's.

More vegetative communities would be protected by right-of-way avoidance areas compared to Alternative A. The protection provided by right-of way exclusion areas would be the same under all alternatives. Future right-of-way corridor widths would be limited to 1,000 feet on each side of the centerline, about the same as under Alternative A and almost twice as large as Alternative C. The risk of weed infestation would be similar to Alternative A, but higher than Alternative C within the disturbed corridor.

The impacts from mineral exploration or development would be similar to those identified in Alternative A, except the acreage of high mineral potential land remaining available for exploration and development would be less. In the Red Knoll ACEC, a smaller area would be proposed for mineral withdrawal (Tables 3-5 and 4-5). Only the land with higher mineral potential would be proposed for withdrawal. Some of the Red Knoll ACEC would remain open to potential mining impacts.

Roads causing resource damage or that are no longer needed would be closed and rehabilitated allowing the possibility for increased biodiversity and improvement of plant communities. It would also help to stem the introduction of invasive weeds and plants such as cheatgrass. When acquiring legal access, emphasis would be placed on providing access to areas containing high public resource values. This would increase the possibility of increased vegetation disturbance in those areas.

### **Alternative E**

Shrub steppe communities over the last 150 years have had impacts that are irreversable, such as grazing by sheep and livestock, introduction of cheatgrass and other nonnative aggressive weeds, suppression of wildland fires, and range improvements that help determine where and when cattle graze. All of these actions have changed the landscape significantly from pre-European contact. None of the planning area is in precontact "pristine" condition, nor would the BLM try to return the landscape to that state (even if it was possible). To abandon active management of the area

would have a long-term negative impact on the shrub steppe plant communities.

Altered vegetation communities would not progress toward desired range of conditions. Natural processes of succession within communities dominated by annual and woody species would rarely progress toward desired range of conditions, even when actions impacting vegetative resources were reduced or eliminated. Additionally, impacts resulting from increased numbers and cyclic growth of wild horse populations, and failure to control the establishment and spread of noxious weeds, would not be consistent with meeting vegetation management objectives.

Monocultures of nonnative seeded species would not be managed to improve diversity. Some smaller stands may contain adequate native seed to develop the desirable mosaic of multi-aged shrubs, forbs, and native grasses as a result of natural establishment. Many larger stands dominated by competitive nonnative species would allow little opportunity for establishment or increased dominance by native species.

In the absence of noxious weed control and management, weeds would continue to impact sagebrush steppe communities and soil stability. Though a number of actions that increase the risk of dominance by noxious weeds would be limited by actions of Alternative E, seed dispersal and soil disturbance favoring undesirable plants would continue. Native sagebrush steppe species do not compete well with many introduced noxious weeds, even when disturbances are removed and seed dispersal mechanisms are reduced (Roche and Burrill 1992; Butler 1993). Lack of adequate measures to control the introduction and spread of noxious weeds would reduce the biodiversity and productivity of many shrub steppe communities.

With the removal of livestock grazing, those impacts identified in Alternatives A–D would be eliminated. The condition of areas previously impacted would recover as allowed by competing exotic annual species and/or lack of soil. Natural succession would improve the condition of many vegetation communities, even though the process would take longer than with active rehabilitation. Altered vegetation communities which have reached or passed a viable threshold and are dominated by annual species and/or noxious weeds would not improve (Figure 4-1). Utilization of forage resources by wildlife would continue. Deposition of plant litter and incorporation of organic matter into the soil would increase across the landscape, resulting in increased productivity, decreased erosion caused by overland flow of precipitation, and progress toward

desired range of conditions. On sites dominated by native species, rates of water, nutrient, and energy cycling would be restored to near-natural levels. Sites supporting shallow-rooted exotic annual species would continue to alter water, nutrient, and energy cycling.

Wild horse populations would have the same impacts as Alternative A. Horses would be retained at appropriate management levels, which could be adjusted.

Short-term impacts to vegetation would occur as existing rangeland projects supporting livestock grazing were abandoned and structures removed. In the long term, areas disturbed during project removal would revegetate naturally to resemble surrounding vegetation communities; however, areas around past waterholes would recover more slowly, depending on the extent of previous impacts.

On average, the annual acreage burned by wildland fire would increase significantly due to greater fuel loads from lack of suppression and decreased grazing. The size and frequency of wildland fire in sites dominated by exotic annual species would increase. Increased fire frequency, especially in sites dominated by flammable annual species and along the tracks of frequent summer storm activity, would maintain communities currently vegetated by annual and shrub vegetation, with little opportunity for the establishment and increased dominance of perennials. Communities with perennials may degrade toward more annual species dominance. As annual species dominance increases, soil erosion accelerates, especially immediately following fire. Lack of rehabilitation to establish desirable vegetation components and protect soil resources would result in significant long-term impacts.

The condition of vegetation resources in areas not subject to frequent fire would improve as the impacts from livestock grazing were eliminated. However, without some prescribed fires or other rehabilitation actions, shrubs would tend to outcompete grass and perennial understory plants. Areas dominated by cheatgrass and other annuals would increase over desirable perennial plant cover. Depending on the soil type and other ecological conditions, conversion of shrub/annual grassland and annual grassland to perennial-dominated communities would occur very slowly. This change would probably be offset by conversion to annual species as a result of frequent wildland fires.

Fine fuels would increase with limited utilization of herbaceous growth, resulting in increased occurrence and frequency of wildland fire. The condition of some vegetation communities currently dominated by a

desirable mosaic of native species and with a healthy understory of forbs and perennials would be maintained in those areas not subject to frequent fire. Frequent wildland fire in healthy, native communities would cause a decline in vegetation diversity and health and would allow for encroachment of weeds and annual species; this would lead to a decline in natural levels of nutrients, water, and energy cycling. Diversity and health of altered vegetation communities dominated by annual species would continue to decline with frequent fire.

Impacts to vegetation from recreation activities would increase within areas of concentrated activity, including developed facilities. Human-caused wildland fire may increase as recreational activity increases, resulting in impacts to vegetation resources.

Limiting OHV use to existing roads and trails on all public lands would limit direct and indirect impacts identified in Alternative A.

The entire planning area would be proposed for withdrawal and would not be available for mineral development; therefore, there would be no associated negative impacts. This would have a positive effect on plant communities because of the lack of disturbance.

Minimal new road construction, as well as the restriction of rights-of-way to existing corridors, would minimize or eliminate long-term impacts of surface disturbance. Limited maintenance of existing roads would increase impacts to vegetative resources as a result of normal breakdown of roadbeds, wet weather rutting by vehicles, and channeling of runoff.

### **Summary of Impacts**

Under Alternative A, sagebrush steppe would continue to improve in areas that are in late seral, although recovery rates and extent of recovery would be reduced in sagebrush areas without perennial understory and in seedings, especially where shrubs have begun to invade. Management would continue on a case-by-case, site-specific basis with less consideration for the ramifications of watershed analysis. Rangeland health standards would be analyzed for each allotment in the resource area. The major impacts to the sagebrush steppe communities are from wildland fires (short-term impact, but possibility of annual exotic plant introduction), invasion by juniper (with loss of diversity, especially in the understory), weed invasion, and continued possible livestock misuse in seedings (such as repeated spring use every year). All of these actions would drive the threshold of site change away from

rehabilitation and toward pure stands of cheatgrass and weeds (Table 4-2). The management goal could not be achieved under this alternative.

Impacts under Alternative B would be similar to Alternative A; however, there would be an increased impact from livestock grazing for increased commodity yield. Improvements could occur on a case-by-case basis, especially with more aggressive juniper management, but would have minimal desirable impact. While noxious weed management would emphasize protection of commodity resources, these actions would have an indirect effect on the desirable vegetative communities. The continued use of nonnative seedings would be counterproductive for biodiversity. The management goal for shrub steppe could not be achieved under this alternative because of the emphasis on commodity production and public uses.

Impacts under Alternative C would be much less than Alternatives A or B, especially with the decrease in livestock AUM's. Because of the wider watershed-scale management approach, recovery rates could be much faster, resulting in better conditions with greater biodiversity and desirable vegetative communities. Alternative C has the most aggressive prescribed burning and wildland fire use, as well as the most aggressive weed and juniper management strategies. With an aggressive emergency fire rehabilitation program, the long-term benefits from prescribed and wildland fire activities could be used to help restore degraded sagebrush steppe communities. This type of fire management, along with greenstripping and other possible mechanical treatments for thinning of sagebrush, could rehabilitate dense, stagnant stands and meet the desired range of condition standards. With emphasis on protection and restoration of natural values, the management goal for shrub steppe communities could be achieved under this alternative, especially in late seral communities.

Impacts under Alternative D would be similar to Alternative C; however, keeping the same livestock

AUM's, management, and livestock grazing strategies could reduce recovery rates for late seral and other shrub steppe communities. The increase of wild horse numbers and AUM's in the Paisley Herd Management Area could reduce the recovery rates in the wild horse areas, especially in the areas that are already in early seral stage, brush with introduced annuals, and seedings. The management goal for shrub steppe communities possibly could be achieved, but at a much slower rate than Alternative C and only with an aggressive program of greenstripping, active seed programs for rehabilitation, prescribed fires, and studies to understand more about sagebrush steppe communities.

The impacts of different grazing systems, by vegetation type, are described in Appendix E2 of the Draft RMP/EIS. Grazing systems are described in Appendix E5. The rest/rotation grazing system would be expected to most improve key species composition. As a result, the vegetation composition on over half of the acres (56 percent) in the resource area would improve under all alternatives. While the rest/rotation system may benefit many vegetation types, it must not be assumed that it would always provide the most benefit. Another grazing system or combination of systems may be better suited for some vegetation types and allotments.

The spring/summer grazing system is the one grazing system that may result in a decrease in key species composition across all alternatives. The key herbaceous vegetation composition would either be improved or maintained under the other five grazing systems across all alternatives—this accounts for 36 percent of the acres under a grazing system in the resource area.

The number of acres with a decrease in species composition in the spring/summer grazing system would vary by alternative. These impacts would be in the short term or as long as the spring/summer grazing systems were still in effect. Under Alternatives B, C, and D, the long-term impacts of spring/summer grazing would be reduced significantly as this system would be replaced

**Table 4-2.—Characteristics of vegetation communities meeting desired range of conditions**

Less desirable to more desirable
Noxious weeds/exotic annuals → desirable nonnative perennials → desirable native perennials/annuals
Limited vegetation structure → multi-structured vegetation → low native species diversity → high native species diversity
No occurrence of cryptobiotic crusts → high presence of cryptobiotic crusts
Disconnected habitats (strongholds disjunct) → connected habitats (strongholds linked) <sup>1</sup>
Diversity at the broad scale only → diversity at many scales

<sup>1</sup> These characteristics may be connected over time rather than space due to Great Basin biogeography and pluvial lakes/flooding.

by spring, deferred, deferred rotation, or rest/rotation grazing systems. The grazing system or combination of systems best suited to replace spring/summer grazing would be determined on an allotment-by-allotment basis, depending on the vegetation and the multiple-use objectives for that allotment. In the long term, there would be less than 1 percent of the acres in the resource area under spring/summer grazing in Alternatives B, C, and D.

The spring/fall and deferred grazing systems would result in a decrease in palatable woody vegetation such as willows, quaking aspen, and antelope bitterbrush across Alternatives A–D.

Under Alternative E, even with the elimination of livestock grazing, impacts resulting from wild horse populations and failure to control the establishment and spread of noxious weeds would have a negative effect on the shrub steppe community. Natural processes would be the primary determinants of ecosystem conditions and plant communities. However, allowing natural processes to dominate in heavily altered ecosystems would not restore natural plant communities, natural ecosystems, or natural fire regimes (assuming “natural” means more typical of pre-Euroamerican settlement conditions). Instead, entirely new ecosystems would develop. In areas dominated by nonnative annual and biennial plants, fire return intervals would decrease. In areas dominated by dense stands of woody species, fire return intervals and subsequent fire severity would increase. These new ecosystems would likely support a different suite of plant species. Population levels of many current species, especially those with limited distribution or already in decline, would likely decrease, and some may be extirpated. Natural processes of succession within communities dominated by annual and woody species would rarely progress toward desired range of conditions, even when actions were taken for rehabilitation. The management goal for shrub steppe communities would not be achieved during the life of the plan if natural processes were left to determine the outcome of habitat conditions.

### **Secondary, Indirect, and Cumulative Impacts**

In studying the cumulative effects of the dynamics of the sagebrush steppe over time, there have been major impacts that are in evidence today. Since introduction of cattle, sheep, and horses into the planning area 150 years ago, many changes have taken place, due in part to changes in fire and livestock grazing management. The most drastic effect on land management was the prevention of wildland fires and the accidental introduction of noxious weeds and nonnative annual grasses

(such as cheatgrass). The altered understory and fire regime, plus accelerated soil erosion, have caused many areas to decline to the point where they have lost the potential for native perennial plant community dominance.

Eight major “states” or pathways of shrub steppe plant community conditions have been modeled by researchers (Figure 4-1; West 1999). These states cross over the divisions of sagebrush species and subspecies that make up the shrub steppe communities. None of the planning area is in pre-contact “pristine” condition, nor is it possible to return the landscape to that state. In analyzing the conditions of sagebrush steppe communities, information from the ecological site inventories and statewide GAP analysis (Kagan and Caicco 1996) was used. Some of the states in the model are easy to capture; however, neither of these mapping methods was very precise in capturing states II, III, or V. The understories that determine each of these states could be examined for site-specific projects or could be determined for grazing allotment analyses. As more information is gathered, this model would help in understanding shrub steppe community dynamics and could influence management decisions.

There is little representation of the late seral sagebrush steppe (state II) which is the relictual (a persistent remnant of an otherwise extinct flora or plant community) remains of the pre-European shrub steppe community. Stagnant sagebrush (state III), which consists of shrubs with depauperate or bare understory, comprises about 4 percent (99,500 acres) of the planning area. Herb-dominated stands (state IV) and areas where perennial native grasses dominate do not occur except in small patches in the planning area (around 2 percent or 54,300 acres). Where they do occur, ACEC/RNA's have been proposed for these plant communities' protection and research. All four of these states can be reversed and have good potential for rehabilitation management and actions.

The remainder of the sagebrush steppe community consists of states that have exceeded the “. . . threshold of site change.” Subsequent management requires expensive, risky, and extensive solutions to return to one of the more desirable native states (I–IV). The remaining states consist of desertified sagebrush steppe, which constitutes brush with only introduced annuals (cheatgrass or crested wheatgrass seedings) in the understory (state V). This comprises about 17 percent (375,000 acres) of the planning area. Introduced wheatgrass and ryegrass pastures (state VI), such as crested wheatgrass seedings, comprise about 3 percent (72,000 acres) of the planning area. Introduced

grass pastures with shrub reinvasion (state VII) comprise about 3 percent (60,640 acres) of the planning area. Cheatgrass/medusahead (state VIII) comprise at least 10 percent of the planning area.

By identifying and quantifying the described conditions (states) of sagebrush steppe in the planning area, management can better direct the use of allotments and rehabilitation possibilities. Also, these states are a method for examining wildlife populations within the same parameters (Knick et al. 1999). It is cheaper and more feasible to foster good stewardship of land having late seral vegetation (manage while in states I–IV) rather than to rely on restoration efforts after degradation has taken place (states V–VIII).

One of the recent proposals for rehabilitation after wildland fires is to plant crested wheatgrass immediately after a fire (especially if preferred native seeds are not available). Then, after the soil has been stabilized, go into the area and replant with native seed. This is costly, and in many instances may not work. Recent research has demonstrated that planting crested wheatgrass caused a decline in soil quality and may increase the amount of carbon dioxide in the atmosphere. Soil revegetated with native grasses is a more effective sink for carbon. The results suggest that the effects of this introduced species extend beyond the displacement of native species and the reduction of diversity, and include the alteration of pools and flows of energy and nutrients in the ecosystem (Christian and Wilson 1999).

The past discussion is a method for determining past use and effects of management on the sagebrush steppe and how the individual plants interact with each other. The major secondary, indirect, or cumulative impacts to sagebrush steppe vegetation is loss of late seral communities, destruction of understory and perennial vegetation, loss of biodiversity, and conversion to marginal and degraded communities below the threshold of possible restoration. In the section on monitoring, methods for breaking up areas of monoculture, whether it be cheatgrass, crested wheatgrass, or sagebrush stands, mechanical means such as brush beating, replanting of sagebrush, or prescription burns all need to be considered to create a mosaic of diverse plant communities.

The impacts on plant communities from activities implemented on adjacent private, state, and Federal lands would involve mainly fire management and recreational uses. The closure of roads and OHV use could have a significant impact on shrub steppe communities. The loss of habitat due to noxious weed

invasion could cause severe impacts to sagebrush communities. Integrated weed management involving all landowners would be important for effective prevention of noxious weed invasion and establishment.

## Riparian and Wetlands

### Introduction

Due to the interrelated nature of riparian/wetland vegetation, hydrology, watershed function, water quality, and aquatic and wildlife habitat, the following section includes a discussion of the impacts of management alternatives on all of these resource values collectively in one location. More detailed descriptions of impacts to some of these related resource values are also discussed in other resource impact sections of Chapter 4.

**Management Goal—*Restore, maintain, or improve riparian vegetation, habitat diversity, and associated watershed function to achieve healthy and productive riparian areas and wetlands.***

### Analysis of Impacts

#### Alternative A

Under current management, BMP's are developed and applied on a case-by-case basis. Because there is currently no set of standard BMP's, they cannot be analyzed here.

Managing for proper functioning condition only as a minimum goal may limit further improvement toward site potential in riparian/wetland areas. In other words, proper functioning condition is not the ultimate goal but the first step in attaining desired range of condition. Focusing specifically on the riparian/wetland areas discounts effects at a watershed scale. Management to promote or maintain proper functioning condition on a minimum of 75 percent of the riparian/wetland areas could limit further improvements toward site potential. Actions that maintain/improve watershed conditions, improve ecological condition, improve vegetation cover and condition, manage nonnative seedings, and manage forest and woodland areas would have a positive impact in the long term on riparian/wetland areas by increasing vegetation cover on uplands and reducing erosion into riparian/wetland areas. Impacts would be minimal, however, because improvement from these actions would be slow and incremental on a variety of sites scattered throughout the resource area.

Juniper removal and prescribed burn projects in upland portions of watersheds could have positive impacts on riparian/wetland vegetation by improving ground cover, infiltration, soil moisture storage, and watershed conditions in the uplands. Increasing grass, forb, and (eventually) shrub cover is expected to improve infiltration rates and soil moisture storage.

Management of special status plant species would have a beneficial effect on riparian/wetland vegetation where the specific plant species depended on improved riparian/wetland vegetation. However, emphasizing management for the requirements of individual species could minimize overall watershed improvement by concentrating on local site improvement at the cost of wider, watershed-level improvement. Incorporation of special status plant species management into allotment monitoring and evaluation processes would be beneficial where the plant habitat depended on improved riparian/wetland vegetation.

Control of weeds would improve or maintain watershed and riparian conditions, which would result in a positive effect to riparian/wetland vegetation. By reducing competition for water and nutrients, ground cover would improve to species with better soil-holding capabilities. Native species protect banks and survive flood flows better than many introduced and noxious weeds. Continued public education would help reduce weed spread.

Continued adjustment of management on riparian/wetland areas would be beneficial to riparian function and water quality. Improvements could be limited by the restricted goals and objectives permitted under the current plans.

Riparian/wetland vegetation maintenance and restoration would improve fish and aquatic habitat; however, improvement limited only to proper functioning condition could prevent further improvement to site potential, as described above.

Managing for proper functioning riparian/wetland conditions that consider plant community structure, cover, forage, and other riparian habitat elements important to game and nongame wildlife species could have positive effects on riparian/wetland vegetation and associated riparian/wetland-dependent wildlife species. Deer fawning and riparian/wetland nesting habitat would improve.

Existing grazing systems have led to improved riparian/wetland conditions, and the option is available to further adjust systems and modify or construct

enclosures to meet objectives (grazing systems and their effects are described in Appendix E-2 of the Draft RMP/EIS and Appendix E-5). However, objectives are defined primarily by proper functioning condition, and as discussed in Chapter 2, proper functioning condition is only a beginning point, with desired range of condition usually being a much more advanced state. Hence, the level of improvement would be limited compared to setting objectives based on site potential.

Impact of grazing authorization and rangeland project implementation on riparian/wetland sites is site-specific. Grazing management on many of these sites in the resource area has been adjusted to maintain or improve riparian sites by managing for vegetation and stream channel improvement. Other sites still need management adjustment, mainly small wetland/riparian areas within larger pastures. Project work would only be completed with environmental analyses and mitigative measures to protect riparian/wetland function.

Authorization of temporary nonrenewable grazing use could preclude the accumulation of surplus plant matter for ground cover, litter development, and enhancement of watershed conditions, riparian/wetland vegetation, and ground-nesting wildlife species. Unauthorized grazing use in riparian or wetland pastures could have a negative impact on these resources. If use is detected early, this action would have a minimal negative effect. If use occurs over a longer period, it could have a negative effect, if bank-stabilizing or wetland vegetation is removed over authorized levels.

Maintenance of current spring developments for livestock, wild horse, and wildlife water would have positive effects on offsite riparian/wetland vegetation by distributing use away from critical riparian/wetland areas. Water availability away from other wetland riparian sites distributes use to more locations. Maintenance of enclosure fences around spring developments and outflows prevents grazing and trampling of vegetation at the spring site. However, by not returning spring flows into their natural channels, loss of riparian/wetland vegetation extent would continue.

Playa or lakebed water development could impact sites currently in proper functioning condition but would be allowed only where it did not negatively impact threatened or endangered plants or animals. Limiting additional playa and lakebed developments would maintain the current proper functioning condition of affected lentic systems and would be a positive impact to wetland conditions. Lakebed development could change the water regimes onsite or allow water to be transported offsite, negatively affecting wetland

vegetation. Lakebed pit construction could penetrate the impermeable subsoil layer in the lakebed and result in the loss of the water-holding capability of the lake.

Wild horses use the herd management areas year-round and impact riparian/wetland sites negatively in some areas (especially springs in the Beaty Butte area). These effects include uncontrolled removal of vegetation and trampling. Confining horses to herd management areas would reduce damage and benefit the riparian resources outside these areas. Effects on riparian/wetland vegetation due to new water development project implementation would need to be determined on a case-by-case basis, but generally new developments near riparian/wetland areas would have a negative effect if horses had access to remove vegetation. Fences and other management structures could have a beneficial effect by preventing use in these areas.

Managing public lands to primarily provide social and economic benefits to local residents, businesses, visitors, and future generations could have potentially greater impacts to riparian/wetland vegetation in the future.

All wildland fires would have a negative short-term impact on wetland/riparian vegetation as ground cover is removed and woody species are burned. Short-term effects from wildland fire in riparian/wetlands that are in proper functioning condition would be less adverse, and functionally, these areas would respond more quickly to revegetation and rehabilitation efforts. In the long term, if the fire resulted in increased perennial ground cover and resprouting of woody species, it would have positive effects by improving watershed conditions. Sprouting species, some willows, and quaking aspen would respond more quickly after fire.

Fire control activities, including fire line construction, aerial retardant application, and engine access, can have negative impacts to riparian/wetland vegetation. These types of fire control activities cause ground disturbance that can result in increased sedimentation and nick-points in stream channels. Effects would need to be determined on a case-by-case basis and mitigated or eliminated where possible.

Rehabilitating burned areas to mitigate the adverse effects of wildland fire on soil and vegetation in a cost-effective manner and to minimize the possibility of wildland fire recurrence or invasion of weeds would have a positive effect on riparian/wetland vegetation and would be beneficial by reducing soil loss and sediment production. However, benefits may be

limited, since emergency fire rehabilitation activities are implemented on a case-by-case basis following wildland fire, and a separate environmental assessment is completed for each emergency fire rehabilitation project.

Prescribed fire can be an effective tool for increasing ground cover and releasing quaking aspen stands from competition with invasive species, and would be beneficial to riparian/wetland vegetation. At the current level of prescribed fire activity (10,000–20,000 acres per year), impacts to riparian/wetland vegetation are minimal and short term. This level, however, may be inadequate to meet the upland vegetation requirements to return to a natural fire cycle. Some quaking aspen sites would continue to decline as juniper outcompeted quaking aspen for water, nutrients, and space. As with wildland fire, prescribed fire can have some short-term detrimental effects as ground cover is removed and erosion and sedimentation increase. These effects can be minimized by prescription design. As ground cover is increased and better soil-holding vegetation is established by grasses rather than shrubs, riparian wetland sites would benefit in the long term.

Current management of the Warner Wetlands Special Recreation Management Area and the remaining public land as an extensive recreation management area could cause negative impacts to riparian/wetland vegetation on some localized sites. Current recreation developments are minimal and have minimal impacts on riparian/wetland vegetation. Increased public use could have a negative effect as more people are attracted to the area and remove vegetation, alter drainage patterns, and compact riparian/wetland sites. Controlling public use could have a positive effect.

Continuing the Cabin Lake/Silver Lake Mule Deer Winter Range Cooperative Vehicle Closure could have a positive effect on riparian/wetland vegetation by limiting off-road travel during a period when soils are saturated and the potential for erosion is greatest. Managing motorized vehicles in accordance with existing open and limited designations would continue to cause negative effects on riparian/wetland vegetation on a site-specific basis, since approximately 2.5 million acres of the resource area are open to OHV's. This allows cross-country travel off of existing roads. Controlling OHV use would have a positive effect by limiting potential for channelization and vegetation removal. Organized events would only be authorized if there were no effects to riparian/wetland resources.

Effects of energy and mineral exploration, location, development, and production would depend on the

location and degree of disturbance. The effects would vary from none, to small-scale effects away from riparian/wetland areas, to major impacts if the exploration requires road development and disturbance in riparian/wetland sites. The effects would be similar for oil and gas leasing, geothermal energy, and mineral material disposal. Effects would occur from ground disturbance that would increase erosion, remove riparian/wetland vegetation, and alter drainage patterns by site and road development. Release of contaminants by development of ore or materials used in extraction could impact riparian/wetland vegetation. Water used in mineral production could dewater streams or reduce stream flows.

Right-of-way development in, across, or near riparian/wetland areas (primarily associated with roads) would have a negative impact on riparian function. Development could result in the loss or constriction of floodplains, disruption or restriction of channel form, and removal of vegetation. Surface and subsurface flows would be disrupted. Drainage patterns could be altered, creating erosion and incision of channels. This type of impact can be observed on several area roads where channels have incised because floodplains have been narrowed by road construction. Most negative impacts to riparian/wetland vegetation would be long term. Rehabilitation following surface disturbance would focus on restoring wetlands to normal functioning conditioning.

Acquiring legal public access to existing, BLM-administered riparian/wetland areas through conservation and scenic easements would ensure future access to these areas, allow management and monitoring of these sites, and should cause no effects to riparian/wetland vegetation. Public use over current levels is not expected over the life of the plan, so impacts should not increase. Riparian/wetland acquisition would increase public land acreage of these special habitats and would benefit riparian/wetland habitats and water quality as specific management is applied to improve these acquired sites. Current policy does not allow for the direct sale of these types of habitats out of the public domain; therefore, the total acres of these habitats would not decrease during the life of the plan.

Construction of new roads or maintenance of existing roads in or through riparian or wetland areas would have a negative impact by reducing vegetation and increasing potential for soil erosion similar to right-of-way development. Development could result in the loss or constriction of floodplains, disruption or constriction of channel form, and removal of vegetation. Surface and subsurface flows would be disrupted.

This type of impact can be observed on several area roads where channels have incised because floodplains have been narrowed by road construction. The degree of impact would depend on the extent of the project within the riparian/wetland zone.

### **Alternative B**

Implementation of BMP's would reduce or eliminate some of the impacts to riparian/wetland habitats described below (Appendix D).

Implementation of riparian/wetland restoration projects would benefit riparian/wetland vegetation. Maintenance of spring developments could have positive impacts on riparian/wetland vegetation by distributing livestock use away from riparian/wetland areas, thereby better managing grazing use and trampling of vegetation.

Actions to maintain/improve watershed conditions, improve ecological condition, improve vegetation cover and condition, manage nonnative seedings, and manage forest and woodland areas would have impacts similar to those under Alternative A. However, positive impacts would likely occur more slowly, since emphasis would be on the production and use of forage, as well as other commodity uses.

Juniper management would have more positive effects on riparian/wetland vegetation than Alternative A, since up to 75 percent of early- to mid-successional stands of juniper would be treated. It is not known exactly what percentage of this juniper management would have a direct benefit to riparian/wetland areas. However, projects associated with riparian/wetland areas would have a high priority to produce more improvement to such sites.

Managing upland habitats so that the forage, water, cover, and plant community structure necessary for wildlife are available on public land would not negatively effect riparian/wetland vegetation if wildlife and livestock use did not concentrate in these areas.

Maximizing authorization of temporary nonrenewable grazing use and increasing livestock grazing use by up to 11,657 AUM's could further preclude the opportunities to enhance other resource values.

Playa or lakebed water developments could degrade sites currently in proper functioning condition and could have a negative impact to wetland conditions. These effects are described in Alternative A.

Wild horse management impacts could cumulatively impact riparian/wetland vegetation if the increase of domestic livestock grazing use occurs in the same area as wild horse use.

Impacts from social and economic uses could be intensified with emphasis on commodity production and other public use.

Wildland fire and rehabilitation impacts would be similar to Alternative A. However, short- and long-term prescribed fire impacts could increase with the threefold increase of prescribed fire activity proposed. Deferment of grazing for a minimum of two growing seasons after wildland or prescribed fire in upland areas would promote residual ground cover necessary for ground-nesting species and protect upland function.

Optimizing management of the Warner Wetlands Special Recreation Management Area and expanding management of existing developed and undeveloped recreation sites could have greater impacts to riparian/wetland vegetation, due to increased visitor use of the area.

Managing motorized vehicles with emphasis on the open OHV use designation and maximizing opportunities for organized OHV events could cause more negative impacts to riparian/wetland vegetation by directly damaging vegetation and increasing erosion.

The effects on riparian/wetland vegetation from energy and mineral exploration, location, and development would be similar to Alternative A, but of greater magnitude since it emphasizes commodity production.

The impacts of disposal or exchange of public lands on riparian/wetland habitats would be similar to Alternative A.

New road construction and maintenance of existing roads would have a greater potential for impacting watershed health under this alternative and therefore, have a negative impact on riparian/wetland vegetation by increasing high flows and contributing excess sediment. However, the level of effect could be minimized by following road construction BMP's for riparian/wetlands.

### Alternative C

Implementation of BMP's would reduce or eliminate some of the impacts described below (Appendix D).

Western juniper, old growth, snag management, and

bighorn sheep management would have the same effects on riparian/wetland vegetation as Alternative B.

Noxious weed management would have the greatest beneficial impacts to riparian/wetland habitats by eradication of a greater number of weeds within the resource area.

Manage upland habitats so that the forage, water, cover, and structure necessary for game and nongame wildlife species would positively benefit riparian/wetland vegetation. Manage livestock forage production to support an increase of 8,390 additional wildlife AUM's would have a minimal impact on riparian/wetland vegetation.

Reducing domestic livestock grazing authorization by 23,015 AUM's and eliminating livestock grazing in riparian conservation areas would eliminate or reduce impacts to riparian/wetland habitats associated with livestock use, including vegetation trampling and overuse, bank destabilization, and fouling the water. Eliminating authorization of temporary nonrenewable grazing use and abandonment and rehabilitation of rangeland projects could also benefit special status species if adequate water is available for use.

Grazing use authorization would be reduced by about 21,647 AUM's, emphasizing other resource values. Grazing impacts would be less from those found in Alternatives A and B, as long as minimum riparian standards for rangeland health were met. Exclusion of livestock in riparian/wetland habitats would have beneficial impacts.

Rehabilitation of spring developments would have positive effects on riparian/wetland vegetation by returning all flow to the original channel, as long as livestock were excluded from these areas. Eliminating new playa and lakebed development and rehabilitating nonfunctioning sites would benefit riparian/wetland habitats and return the sites to proper functioning condition.

Impacts from suppression of wildland fires would be greater than Alternatives A or B. With the increased upper limit of 640,000 acres burned annually and the possible designation of areas for wildland fire use, there is a potential for an increased, permanent loss of riparian/wetland vegetation, depending on where the fires occur and the condition of the habitat prior to the burn. Nonfunctioning riparian/wetland areas could be identified and not placed in designated wildland fire use areas. In habitat in proper functioning condition, wildland fire use would cause temporary riparian/

wetland vegetation loss. Emergency fire rehabilitation would continue to occur to meet resource objectives and rehabilitate areas in nonfunctioning condition.

Prescribed fires could be designed to mitigate or eliminate habitat losses through the use of BMP's. Prescribed burn projects could have more impact than Alternatives A and B, since the upper size limit for prescribed and wildland fires combined would increase to 640,000 acres per year. Riparian/wetland areas in proper functioning condition would recover from fire quicker than those not functioning properly and the impacts would be short term. These effects would be the same as described in Alternative A.

Improving ecological conditions and restoration in the uplands after a prescribed or wildland fire would benefit riparian/wetland habitat by maximizing vegetative production, protecting upland function, and contributing to the continued health of the watershed. Minimum standards for rangeland health would be followed. Rehabilitation seed mixes would be limited to native perennial species only.

Managing recreational use in the Warner Wetlands Special Recreation Management Area and emphasizing undeveloped, dispersed recreation opportunities in North Lake Special Recreation Management Area would benefit riparian/wetland vegetation.

Managing motorized vehicles with an emphasis on the limited OHV use designations and restricting organized OHV events to existing roads and trails would benefit riparian/wetland vegetation.

Effects of energy and mineral exploration, location, development, and production on riparian/wetland habitats could vary from small scale to major impacts if the exploration requires road development and other disturbance. Although all practical measures to maintain or restore riparian/wetland habitat are required of all mining operations, impacts to these resources would continue to occur in the form of localized surface disturbance over the short term. The effects would be similar for oil and gas leasing, geothermal energy, and solid mineral material disposal. The effects would be less than either Alternatives A or B, since this alternative emphasizes protection of natural values and closes certain areas to mineral entry.

The impacts of disposal or exchange of public lands on riparian/wetland habitats would be similar to Alternative A.

New road construction would have less potential for

impacting watershed health under this alternative and therefore, would have minimal impacts on riparian/wetland habitat. The level of effect could be minimized by following BMP's, road construction and rehabilitation standards, and adhering to other resource objectives. The removal of all roads within riparian conservation areas and other unneeded roads within the resource area would positively impact riparian and watershed conditions.

#### Alternative D

Implementation of BMP's would reduce or eliminate some of the impacts described below (Appendix D).

Western juniper, old growth, snag management, and bighorn sheep management would benefit riparian/wetland habitat.

Noxious weed management would benefit riparian/wetland habitats, with greater emphasis on restoration of infested areas.

Managing upland habitats so that the forage, water, cover, structure, and security necessary for game and nongame wildlife species would benefit riparian/wetland vegetation. Managing livestock forage production to support an increase of 9,138 additional wildlife AUM's would have a minimal impact on riparian/wetland vegetation.

If standards and compliance with the conditions of the "Bald Eagle Management Area Plan" (USDA-FS 1994) are followed, effects to riparian/wetland vegetation from timber management would be minimal.

Grazing impacts on riparian/wetlands would be minimized under this alternative as long as minimum standards for rangeland health were met. Implementing livestock grazing systems in riparian conservation areas that promote the recovery or maintenance of riparian systems to the desired range of conditions (based on site potential) would benefit riparian/wetland habitats. The potential for authorization of suspended nonuse and temporary nonrenewable grazing use could cause impacts to riparian/wetland vegetation; however, these uses would only be authorized if conflicts with other uses would not occur. The abandonment and rehabilitation of rangeland projects that do not contribute to meeting other management objectives could benefit riparian/wetland vegetation and allow for restoration of sites not in functioning condition.

Modification of spring developments would benefit riparian/wetland vegetation by distributing livestock

use away from riparian/wetland areas, thereby better managing grazing use and trampling of vegetation.

Restricting further playa and lakebed development and initiating restoration of these systems would benefit riparian/wetland habitats by returning the sites to proper functioning condition.

Impacts from suppression of wildland fires and prescribed fire use would be greater than Alternatives A or B and similar to Alternative C. With the increased upper limit of 640,000 acres burned annually and the possible designation of areas for wildland fire use, there is potential for the permanent loss of more riparian/wetland vegetation, depending on where the fires occur and the condition of the habitat prior to burning. Prescribed fires could be designed to mitigate or eliminate losses, and nonfunctioning riparian/wetland areas could be identified prior to the designation of new wildland fire use areas. Emergency fire rehabilitation would continue to occur to meet resource objectives and rehabilitate areas not in functioning condition. Riparian/wetland areas in proper functioning condition would recover more rapidly than those not in proper functioning condition, and impacts would be short term.

Improving ecological conditions and restoration in the uplands after a prescribed or wildland fire would have the same beneficial impacts on riparian/wetland habitat by maximizing vegetative production, and would protect upland function and contribute to the continued health of the watershed. Minimum standards for ecosystem health would be followed and seed mixes would not be limited to native perennial species only.

Management of recreational use in the Warner Wetlands and North Lake Special Recreation Management Areas would benefit riparian/wetland vegetation by limiting use in these areas.

Managing motorized vehicles with more of an emphasis (than Alternatives A or B) on the limited OHV use designations and restricting organized OHV events to existing roads and trails would benefit riparian/wetland vegetation.

Effects of energy and mineral exploration, location, development, and production in riparian/wetland habitats could vary from small scale to major impacts if the exploration required road development and other disturbance. Although all practical measures to maintain or restore riparian/wetland habitat are required of all mining operations, impacts to these resources would continue to occur in the form of localized surface

disturbance over the short term. The effects would be similar for oil and gas leasing, geothermal energy, and solid mineral material disposal. The effects would be less since they emphasize protection of natural values and close more areas to mineral entry than either Alternatives A or B.

The impacts of disposal or exchange of public lands on riparian/wetland habitats would be similar to Alternative A.

New road construction would have less potential for impacting watershed health than Alternatives A or B. The level of effect could be minimized by following road construction and rehabilitation standards and adhering to other resource objectives and BMP's. The removal of any roads within riparian conservation areas that are impacting the stream and/or riparian zone would improve riparian and watershed conditions.

### **Alternative E**

Full implementation and maintenance of the Warner Wetlands and Lake Abert ACEC plans would not occur under this alternative and would cause negative impacts to riparian/wetland vegetation from erosion and flooding.

Natural processes would regulate western juniper, old growth, and snag management under this alternative. Juniper expansion would continue causing negative impacts to riparian/wetland vegetation.

Special status plant species would not be actively managed under this alternative except for future federally listed species, as specified in future recovery plans. This action would have a minimal effect on riparian/wetland vegetation.

Noxious weed management would focus only on high priority areas to protect adjacent private property and would have negative impacts on riparian/wetland habitats currently infested or occupied in the future under this alternative.

Maintenance and restoration would not occur in fish and aquatic habitat, continuing to cause negative impacts to riparian/wetland vegetation.

There would be no management of upland habitats (including rangeland improvements) to provide forage, water, cover, structure, and security necessary for game and nongame wildlife species. This would cause negative effects on riparian/wetland vegetation due to concentrated wildlife use. Bighorn sheep would be

allowed to disperse naturally and could cause negative effects on riparian/wetland vegetation if concentration occurs.

Since livestock grazing would be eliminated under this alternative, there would be no effects from grazing management.

BLM-authorized projects would be limited to those required by law and wild horse survival. BMP's would be implemented on any new projects. The abandonment of all rangeland projects could negatively impact riparian/wetland vegetation by concentrating wildlife use. No maintenance or rehabilitation of spring developments would occur under this alternative, negatively affecting riparian/wetland vegetation within nonfunctioning sites. Restoration of playa and lakebed habitats would not occur under this alternative, negatively affecting nonfunctioning riparian/wetland areas and areas at risk in the future.

Wild horses could cause negative impacts to riparian/wetland vegetation if horse numbers increased above appropriate management levels and concentration occurred.

Social and economic uses would cause the least impact to riparian/wetland vegetation, since no commodity production would be allowed from public land.

Prescribed burning would not be initiated under this alternative. Impacts from wildland fires would be the greatest under this alternative. The appropriate management response would emphasize initial attack, full suppression only to protect human life, and other Federal, state, or private property. Large tracts of crucial wildlife and special status species habitat could be burned and left unusable for the life of this plan. No emergency fire rehabilitation would be completed following a wildland fire. Riparian/wetland areas currently below proper functioning condition would not be restored after wildland fire. Future conditions of riparian/wetland areas would be the result of natural processes across the landscape, as no restoration would be conducted.

Managing motorized vehicles with emphasis on limited and closed OHV use designation and not authorizing organized OHV events would have the same effects on riparian/wetland vegetation as Alternative C.

The effects on riparian/wetland habitat from the energy and minerals program would be least under this alternative, only authorizing energy and mineral actions required by law.

No riparian or wetland acquisition or disposal would occur under this alternative, negatively affecting the potential for increase of riparian/wetlands in public ownership.

New road construction would have the least potential for impacting watershed health under this alternative. Only new roads required by law would be constructed. The level of impacts could be minimized further by following road construction and rehabilitation standards and adhering to other resource objectives and BMP's. Road maintenance would not occur under this alternative. Those roads negatively affecting riparian/wetland areas would continue to cause impacts, and other roads would have potential to cause negative effects in the future without regular maintenance.

### ***Summary of Impacts***

Under Alternative A, riparian/wetland vegetation and associated wildlife habitats would continue to improve, although recovery rates and extent of recovery would be reduced to allow for commodity uses, including livestock, transportation, and recreation. Management would continue on a case-by-case basis on a site-specific level with less consideration for watershed-scale effects. The major impacts to riparian/wetland vegetation are from wildland fire (short-term impact), and the lack of an aggressive juniper/quaking aspen and weed management program (long-term impact). The management goal for riparian/wetland vegetation could be achieved under this alternative, with the exception of quaking aspen management and the continuing encroachment of juniper into these stands. Without immediate treatment, some quaking aspen stands could be lost forever. Wetland areas could also be infested with noxious weeds if more effective chemicals are not approved.

Because of law and policy ("Endangered Species Act" and "Clean Water Act" [CWA], etc.) setting high minimum management standards, the impacts from Alternative B would be similar to Alternative A, even though commodity production would be emphasized. Minimally acceptable conditions would be required, and mitigation would occur on a case-by-case basis rather than on a watershed scale. While improvements would occur, they would take longer and not be as extensive as under Alternative A. The management goal for riparian/wetland vegetation could be achieved, but at a much slower rate due to the emphasis on commodity production and public use. Noxious weed management would emphasize protection of commodity resources as opposed to watershed resources. Juniper management would be more aggressive than

Alternative A and would have a beneficial impact to riparian/wetland vegetation.

Negative impacts from Alternative C would be much less than under Alternatives A or B. Recovery rates would be much faster, resulting in better riparian/wetland vegetation conditions. Watershed-scale effects would result in more stable conditions. With emphasis on protection and restoration of natural values, the management goal for riparian/wetland vegetation would be achieved. This alternative has the most aggressive weed, juniper, prescribed burning, and wildland fire use management programs, which could cause greater short-term impacts to riparian/wetland vegetation. An aggressive emergency fire rehabilitation program following wildland fire, coupled with prescribed fire, could be used to restore nonfunctioning riparian/wetland sites.

Impacts from Alternative D would be similar to Alternative C; however, recovery rates for riparian/wetland vegetation would require more time to achieve desired range of condition. Slower recovery rates would be due to less stringent direction to restore watershed function, so less improvement would occur. More consideration is given to watershed scale effects than under Alternatives A and B. The management goal for riparian/wetland vegetation could be achieved under this alternative.

Impacts from Alternative E would be similar to Alternative D; however, without active restoration, currently nonfunctioning riparian/wetland habitats may never reach their full potential. Watershed-scale effects would progress toward natural recovery of uplands, but increased juniper encroachment would continue to cause negative watershed level effects to riparian/wetland vegetation. By allowing natural processes to determine the outcome of habitat conditions, the management goal for riparian/wetland vegetation may never be achieved on limited sites under this alternative.

### **Secondary, Indirect, and Cumulative Impacts**

The major secondary, indirect, or cumulative impacts to riparian/wetland vegetation are habitat loss, destruction, conversion to less marginal habitat, and loss of habitat connectivity. This habitat loss can result from upstream impacts on other land ownerships from forest stand conversion, channel alteration, water withdrawal, road construction, and other vegetation treatments.

The cumulative effects of conversion of riparian/wetland habitat in combination with the BLM's pro-

posed alternatives could have major impacts on special status and other wildlife species dependent on these habitats. Private landowners have converted and drained some wetland habitats to create livestock forage and pasture. Channelization and irrigation water withdrawal on private lands have altered flood and late season flows, which has impacted lower stream reaches and wetland function. Some private landowners have also implemented wetland restoration projects that restore riparian/wetland function. Activities involving prescribed burning would have to be coordinated with adjacent landowners to minimize cumulative, short-term impacts caused by the combined actions. The loss of habitat due to noxious weed invasion could cause severe impacts to riparian/wetland vegetation and special status and other wildlife species using these habitats. Integrated weed management involving all private landowners is essential to protecting these habitats from noxious weed invasion and establishment.

Actions that have a cumulative effect on watershed function, especially in relation to a watershed's ability to capture, store, and slowly release water, would effect riparian and wetland vegetation. On United States Forest Service (USFS) and private lands in the upper elevations of shared watersheds, forest management practices such as commercial and precommercial thinning, partial cut and sanitation, salvage sales, prescribed burning, and wildland fire, would cause negative impacts downstream. On most forested watersheds in the planning area, equivalent clear-cut acres from timber harvest and road construction (resulting in increased canopy openings and decreased ground cover), along with channel incision and channelization, have resulted in increased flood flows, increased flood frequency, and floods that occur earlier in the season. The Deep Creek, Silver Creek, and Chewaucan watershed assessments/analyses (USDA-FS and USDI-BLM 1998a; USDA-FS 1997b, 1999) have demonstrated these changes to some degree in each watershed. The change to earlier, more frequent and intense flood flows has impacted channel form, and thereby fish and aquatic habitat. The cumulative effects that created our current conditions are now being reversed as watershed/landscape analyses are completed and forest health improvements are implemented. Improving forest health should improve watershed conditions, thus having a beneficial effect on riparian/wetland vegetation. The cumulative effect of these projects would build over time to again return to better fish and aquatic habitat conditions.

Private land trends are difficult to predict, but more programs are available to assist private land owners in

implementation of watershed improvements. With increased participation of private land managers, some improvement in stream conditions is anticipated.

Increased sedimentation could result as roads and culverts are placed. However, effects would need to be determined on a case-by-case basis and could be minimized by mitigation.

## Forest and Woodlands

**Management Goal 1—*In commercial (pine) forest stands, maintain or restore forest health and meet wildlife habitat needs.***

### *Assumptions*

Due to scattered locations, small area size, harsh sites, and low volumes per acre, management of the commercial forest stands for programmed, sustained yield of commercial forest products is not economically feasible. Treatment of the scattered stands outside SMA's (ACEC/RNA's, WSR's, WSA's, etc.) is usually not feasible unless combined with similar land on adjacent ownerships or as part of a larger landscape treatment. As a result, acres of forest treatments and commercial production are not predictable and are not discussed below.

### *Analysis of Impacts*

#### Alternatives A–D

Management of commercial forestlands within SMA's would be directed by specific plans to protect the special values of the area. Outside SMA's, commercial forest stands would be treated on an "opportunity" basis, as described above. Wildland fires which threaten commercial stands would be fully suppressed in most cases. Table 4-3 shows a summary of impacts to commercial forestland by alternative.

#### Alternative E

No stand treatments would be done. Forest stands, as a result, would typically be dense, overstocked, and stressed. As ladder fuels increased, the risk of catastrophic loss of entire forest stands from wildland fire would increase over time. Risk of catastrophic loss from insects and disease would also increase over time, as trees became more stressed and less resilient.

### ***Summary of Impacts***

Alternatives A–D would have similar impacts. Table 4-3 shows that the area of commercial forest within SMA's is the same across these alternatives (8,739 acres, or 60 percent of the total commercial forestland). Management of these forestlands would be guided by, and subordinate to, the management objectives of the SMA's in which they are located. Treatment of the scattered stands outside SMA's is usually feasible only when it can be combined with treatments on adjacent ownerships or as part of a larger landscape treatment. Wildland fires which threaten commercial forest stands would be suppressed in most cases. Under Alternative E, no stand treatments to improve forest health would be done.

### ***Secondary, Indirect, and Cumulative Impacts***

The extent of forest health treatments on commercial forestlands, mainly by thinning and prescribed fire, would be uncertain under Alternatives A–D. Since these forest stands are relatively small in size, any treatment would be dependent on landscape-scale applications, feasibility to combine with adjacent ownerships, or the overall management objectives of SMA's. Under Alternative E, no stand treatments would be done. As understory densities increased, trees would become more stressed and less resilient. Risk of catastrophic loss from insects and stand-replacing fires would increase with time, with little or no natural regeneration of trees due to destruction of the seed source and competition for light, nutrients, and water.

**Management Goal 2—*Restore productivity and biodiversity in western juniper woodlands and quaking aspen groves.***

#### Alternatives A–D

Outside historic (old growth) sites, western juniper woodlands would be managed for the enhancement of other resource values. In areas dominated by invasive juniper (less than 130 years old), management would be driven by the goal of maintaining or restoring native grass or shrub communities after removal of the juniper overstory.

The concept of a sustained yield of commercial forest products does not technically apply, since the species itself is classified as noncommercial. A programmed harvest of juniper products on a sustained-yield basis is not proposed under any alternatives in this plan. However, recovery or salvage of such products as

**Table 4-3.—Lakeview Resource Area forest area within and outside special areas by alternative <sup>1</sup>**

	Alternative				
	A	B	C	D	E
<b>Commercial forests <sup>2</sup></b>					
Total forest area	14,455	14,455	14,455	14,455	14,455
Within special areas	8,739	8,739	8,779	8,739	0
Outside special areas	5,716	5,716	5,676	5,716	14,455
<b>Juniper woodland</b>					
Total forest area	215,052	215,052	215,052	215,052	215,052
Within special areas	34,887	36,845	61,117	60,424	0
Outside special areas	180,165	178,207	153,935	154,628	215,052
<b>Quaking aspen <sup>3</sup></b>					
Total forest area	2,063	2,063	2,063	2,063	2,063
Within special areas	87	87	87	87	0
Outside special areas	1,976	1,976	1,976	1,976	2,063

<sup>1</sup> Special areas include WSA's, ACEC's, RNA's, and WSR's.

<sup>2</sup> Commercial forests include ponderosa pine and other forest types from the Oregon GAP dataset.

<sup>3</sup> Since quaking aspen stands are typically smaller than the minimum mapping unit size used in the GAP analysis, these acre values are assumed to be underestimated.

firewood, posts, poles, sawlogs, boughs, and biomass would take place on many of the juniper stands which have been burned or identified for treatment (Map V-3) for enhancement of other resource values.

Management of juniper woodlands within ACEC/RNA's could be further defined in specific plans to protect the special values of the areas. Management of juniper within WSA's would be limited to wildland fire use or prescribed fire methods by the "Interim Management Policy for Lands Under Wilderness Review" 1995 (wilderness IMP) (USDI-BLM 1995b). Table 4-3 shows a summary of impacts to juniper woodlands by alternative. In treated areas, juniper dominance would be generally limited to rocky outcrops, ridges, and other historic (old growth) sites where wildland fire frequency is limited by lower site productivity and sparse fuels. Western juniper would occur at low densities in association with vigorous shrubs, grasses, and forbs (where site potential permits). Historic western juniper sites would retain old growth characteristics.

Under Alternative A, quaking aspen stands would be treated on a case-by-case basis. Treated stands would improve through removal of competing species and/or promotion of regeneration. Untreated stands would continue to decline (Wall et al. 2001) due to competition and lack of resprouting. Under Alternatives B, C,

and D, the direction to treat all quaking aspen stands within the life of the plan would greatly improve stand condition and benefit aspen-dependent wildlife species.

#### **Alternative E**

No active restoration treatments would be done in western juniper or quaking aspen stands.

Western juniper would continue to dominate invaded sites, as well as historic juniper sites. Western juniper woodlands would continue to increase in density and area, except in areas of recent wildland fire. Historic western juniper sites would continue to experience an increase in younger trees, with increased mortality of individual old growth juniper on the driest sites.

Quaking aspen stands would continue to decline and die out (Wall et al. 2001), except after instances of wildland fire.

#### **Summary of Impacts**

Table 4-3 shows the area of juniper woodlands located within SMA's, ranging from 0 to 28 percent, depending on the alternative. Management of these juniper woodlands would be determined by the specific objectives for the special management area (SMA). Alternative A would maintain the present management

practice of meeting public demand for juniper products, while reserving individual snags and old growth trees within treatment areas. By maximizing juniper harvest and treating up to 75 percent of early- to mid-successional juniper woodlands, Alternative B would treat the largest area of juniper and provide the greatest release of native grass and sagebrush communities. Alternatives C and D would treat fewer acres, while Alternative E would involve no management treatments at all.

Alternative A would provide no guidelines for quaking aspen management, while Alternatives B, C, and D would prescribe treatment of all quaking aspen stands being invaded by western juniper and provide the greatest benefit to aspen-dependent wildlife species. Alternative E provides no active treatment of quaking aspen stands.

### ***Secondary, Indirect, and Cumulative Impacts***

Historic (old growth) juniper sites would be managed to enhance old growth trees (by thinning or fire) under all alternatives except Alternative E. These old growth stands would improve in vigor by removing competitive, smaller, invasive trees. In areas dominated by invasive juniper (less than 130 years old), the greatest improvement in grass/sagebrush communities would occur through the release of native grasses and sagebrush under Alternative B. Alternatives C and D would treat fewer acres but still improve species composition on a large scale. Alternative E would result in continued juniper expansion and increased density in existing invaded areas. Alternative A would not specifically address management of quaking aspen groves, but Alternatives B, C, and D would improve condition of aspen groves by treating all groves being invaded by western juniper, which, in effect, is nearly all aspen stands. Alternative E would involve no treatment and would allow juniper to take over these stands, with a subsequent decline and termination of the quaking aspen groves.

## **Special Status Plants**

**Management Goal 1—Manage public lands to maintain, restore, or enhance populations and habitats of special status plant species. Priority for the application of management actions would be: (1) Federal endangered or threatened species, (2) Federal proposed species, (3) Federal candidate species, (4) State listed species, (5) BLM sensitive species, (6) BLM assessment species, and (7) BLM tracking species.**

**Management Goal 2—Protect, restore, and enhance the variety of native plant species and communities in abundance and distributions that provide for their continued existence and normal functioning.**

### ***Analysis of Impacts***

#### ***Alternative A***

The present management is driven by the requirements of the individual plant species and would emphasize maintenance rather than restoration and enhancement. Conservation agreements would be written and implemented with the U.S. Fish and Wildlife Service (USFWS) for those species at highest risk. This would leave some other special status species at risk and leave little emphasis on managing for those specific habitat requirements.

Management of special status plant species/communities and cultural plant species/communities would improve vegetation community diversity.

Weed invasions into areas where rangeland health has declined or where surface disturbing projects are developed would have a major, adverse impact on special status plant populations. Weeds would compete directly for resources (space, light, water) and could prevent special status plants from fully occupying their historic ranges. This would be especially true for medusahead invasion in sensitive buckwheat sites, one of the few noxious weeds that invades these barren ash soil sites.

The continuation of current livestock grazing practices, including seasons of use, stocking levels, and turn-out locations, could have an adverse, long-term impact on some special status plant species. Exclosure fences have been constructed at three sites to evaluate the effect of grazing pressures on special status species: prostrate buckwheat, Columbia cress, and Bogg's Lake hedge-hyssop. Repeated studies at these sites for the past 7 years have demonstrated that all three plant species have been negatively impacted by livestock grazing. The prevalence of introduced plants that now compete with native species (especially cheatgrass), grazing on the plants, and the direct trampling impact of livestock, suggest that overall impacts on special status species are and would continue to be adverse. Direct impacts to certain species which are known to be palatable to livestock would continue to be adverse unless sites were fenced or grazing impacts were otherwise mitigated, such as through a change in the season of use.

Creation of exclosures around parts of the special status plant species areas have produced a baseline of foraging use (livestock and wildlife) effects for comparison to nonforaging areas and protected habitat. This data helps with management of the plant species and has added to the general biodiversity of the communities.

Fire management would have a variety of impacts on special status plants. Wildland and prescribed fires have a positive impact on some of the species. For many species, there is not enough biomass or fine fuels to carry a fire in the plant community. Fire suppression activities, such as line construction, would avoid plant sites as much as possible. Maps have been prepared with plant locations for resource fire advisers to use to avoid sites.

Use of heavy equipment in existing ACEC's, RNA's, and WSA's would be avoided and would require line officer approval. Use of retardant would not be limited within these areas for initial attack. Use of retardant during extended attack would be considered as part of the wildland fire situation analysis, considering the resource values at risk. Maps showing SMA boundaries and sensitive and cultural plant species locations would be available for wildland fire situation analyses. As a result of these precautions, impacts to special status plants or communities from fire suppression would be minimal. Management for some special status species and cultural plants that are not fire tolerant (unknown for some of the species) might constrain the use of prescribed fire.

Seeding or planting of native or exotic plant species to stabilize wildland fire or other disturbed areas or to provide additional forage for wildlife or domestic livestock, could alter habitat or affect populations of special status plant species. These actions could increase competition for occupation of a site and alter nutrient cycling regimes by the extensive use of nitrogen-fixing species, such as legumes, in the seedings.

An increase in recreation use within areas of high special status plant concentrations would result in adverse impacts. This could occur through trampling and subsequent weed introductions where sites are disturbed. An increase in OHV activities could result in long-term adverse impacts on special status plant species, particularly those occurring on volcanic ash and sandy soils. Impacts would include destruction of habitat, destruction of plants, and weed introductions resulting in habitat modification and increased competition for resources. Overall, recreation use is antici-

pated to be adverse.

Locatable mining activities, leasable mineral activities, and mineral material disposal activities would have the potential to impact special status plants and their habitats. The extent of impacts would be determined primarily by the amount of activity, location, and mining techniques. Leasable mineral activities would be subject to stipulations which generally result in minimal direct impacts to special status plants. Habitat fragmentation could cause long-term indirect negative impacts, as gene flows could be disrupted where sites become unavailable for colonization and exotic/noxious weeds are introduced. Mineral material disposal activities would have no impact on special status plants because this would not be allowed near known occurrences or habitats.

Adjustments in land tenure would generally be beneficial, as BLM policy emphasizes retention of public land with high resource values and would not permit exchange or sale of public land occupied by special status species (unless land of equal or higher biological value is acquired in exchange). Prior to approval and issuance of any rights-of-way, lease, or permit, site examinations for special status plants would be conducted; therefore, generally no adverse impact would occur.

### **Alternative B**

Vegetative treatments, including juniper control, prescribed burning, and seedings, could impact special status species, depending on the species, the number of exotic species within the area, overall ecological condition, and the likelihood that exotics would colonize the sites following treatment. Field surveys would be conducted prior to treatments; however, due to the generally large size of such treatments, species may be overlooked and adverse impacts could result if species are uprooted during mechanical treatments.

Increased livestock use would have a short-term impact to special status plant species particularly through trampling in concentrated use areas, defoliation of the palatable species, and potential introduction of weed seeds into new sites. Exclosure fences would be constructed to protect plant sites; some individual sites could be lost because of the lag time between establishing and confirming monitoring results and construction of protective exclosures. Long-term impacts would be slight to moderate to species as a whole; direct long-term negative impacts to certain species which are known to be palatable to livestock would continue at most sites, except those areas fenced to exclude

livestock.

Depending on the number of projects proposed, construction of new projects could result in long-term indirect adverse impacts on some species if the projects resulted in moving livestock into areas that were previously used lightly. In some cases, special status plants could benefit by improved dispersion of livestock. This action may result in numerous indirect impacts to species, particularly through introduction of weed seeds and potential reduction in seral stages at localized sites.

As in Alternative A, locatable mining activities, leasable mineral activities, and mineral material activities would have the potential to impact special status plants and their habitats. In the Devils Garden, if not designated wilderness, all lava resources would be available for commercial collection. Though no special status plants are known to exist in the area, one rare *Mimulus* species may grow there. Inventories would have to be carried out before mining occurs. Lake Abert would be open to mining salts in the lake. This does not threaten any plant species, but extraction, development, and other disturbances related to mining could have an adverse impact on special status plants.

Fire management would have the same potential impacts as Alternative A, as would the seeding or planting of native or exotic plant species to provide additional forage for wildlife or domestic livestock or to stabilize disturbed areas.

An increase in recreation uses in areas of high plant concentrations would result in adverse impacts to special status plant species. This could occur through trampling and subsequent weed introductions where sites are disturbed. Overall, recreation use would be slight to moderately adverse, depending on concentrations of recreational use. OHV activities would have the same types of impacts as in Alternative A.

Impacts from adjustments in land tenure and rights-of-way, leases, or permits would be the same as Alternative A.

### Alternative C

This alternative would manage for desired range of conditions by using a mix of restoration and enhancement measures for special status plant species, and by using protection measures only where there are no opportunities for restoration. It would emphasize land management that fosters overall community health, habitat integrity, and landscape-level issue resolution,

as well as meeting the requirements of individual species and their habitats. Conservation agreements would be developed to protect and monitor special status plant species and habitats. There also would be more emphasis to conduct systematic inventories of populations and distributions of special status plant species where baseline information does not currently exist.

Vegetation treatment impacts would be the same as Alternative B. However, there would be fewer treatments, and less acreage would be treated and impacted.

Wildland fire management impacts would be the same as Alternative B, with special status plant species considered in all suppression actions. Since most sensitive plants are adapted to fire, the implementation of more prescribed fire, compared to Alternatives A and B, would not significantly impact sensitive plant species. Prescribed fire is recommended at Cave Springs (which is now fully protected from grazing by fencing) as a method of clearing vegetation, which is competing with the reestablishment of desert allocarya. Several other methods of reestablishing this extirpated species have been attempted, and all have failed.

Livestock grazing would decrease AUM's by 20 percent, and no temporary nonrenewable grazing use would be authorized, thus lessening the adverse effects on sensitive plants. This would be especially true in areas where livestock grazing has been documented to have a direct effect on specific special status plants. Studies have shown, using existing exclosure fences around part of the communities, that special status species plants are being threatened by grazing of wildlife, livestock, and wild horses. Fencing would protect populations of Bogg's Lake hedge-hyssop, prostrate buckwheat, Cusick's buckwheat, snowline cymopterus, and Columbia cress from livestock and wild horses.

Observation and monitoring have demonstrated that wild horses prefer areas that are open and similar to the ash-flow, open soil areas of sensitive plant species. Horses tend to destructively congregate in these areas and mark them with their dung piles. In the Beaty Butte Herd Management Area, horse trails cross several sensitive plant species areas. While the AUM's of forage for wild horses would not change in either herd area, wild horse impacts would still occur. The population of Crosby's buckwheat near Fish Fin in Beaty Butte, and possibly Cusick's buckwheat and snowline cymopterus in the Black Hills, would need to be monitored to determine if horses are causing damage to those populations. Horses range and graze much

differently than livestock; the ashy hills where the buckwheats grow are regularly visited by wild horses. Wild horse hoof action and creation of trails kill the plants that are barely surviving in these hostile habitats.

Nine of the ACEC's (proposed and existing) have special status species growing within them and would be managed, in part, to enhance those values. Creating ACEC's with special management would have beneficial effects for both plants and their habitats within the ACEC boundaries. The added protection of overlapping WSA boundaries exists on about 115,652 acres. In these nine ACEC's, careful consideration would be given to mitigate or deny authorization of activities that could have a potentially negative effect on the plants or habitats. What may be good for other resources (such as project developments) could have a negative impact on the plants or their habitats. WSR designation of Guano Creek in the area of Crosby's buckwheat and grimy ivesia would limit mining activity and other potentially surface-disturbing activities.

Benefits to be derived from OHV restrictions would include elimination of OHV disturbance for specific, vulnerable special status plants and their populations. The likelihood that OHV activity would bring weed seed into species habitat would be reduced; however, weed establishment may still occur through other means. In addition, limitations in all ACEC/RNA's to designated roads and trails would provide protection to plant sites. Benefits would occur to sites currently identified as vulnerable to OHV activity, and emergency closure procedures would be used if new conflicts were identified. OHV activity in parts of the volcanic ash and sand complexes, where limitations would not be imposed, would result in certain plants being vulnerable to direct and indirect impacts in the short term.

Locatable mining activities, leasable mineral activities, and mineral material disposal would be much more restricted than Alternatives A or B, including mineral withdrawal for most of the Red Knoll ACEC. There would be less possibility of disturbance to sensitive plant sites by mineral extraction, access road construction, or other supporting activities.

Issuance of any rights-of-way, leases, or permits would have the same impacts as Alternative A. Adjustments in land tenure would be advantageous to special status plants. This alternative places emphasis on acquiring land of high habitat quality and containing other significant biological resources, including special status species. An opportunity to acquire a private section of Mud Creek (20 acres) through the coopera-

tion of The Nature Conservancy, would protect Oregon semaphore grass (*Pleuropogon oregonus*), the only Federal candidate for listing in Lake County. There is also an opportunity to reintroduce this species in other locations on Mud Creek from grass stock grown at Oregon State University.

#### Alternative D

This alternative is similar to Alternative C, except that protection of habitats or populations would have equal management weight with that of habitat restoration or enhancement. Conservation agreements would be developed to protect special status plant species and habitats. Conservation strategies would then be written to ensure the continuance of these species. Systematic inventories of populations and distributions of special status plant species would be conducted as in Alternative C.

Vegetation treatment impacts would be similar to Alternative C, particularly those associated with prescribed fire treatments.

Livestock grazing would be the same as Alternative A. The current livestock grazing practices, including seasons of use, stocking levels, and turnout locations, would have an adverse long-term impact on some special status plant species. Even though administrative solutions would be emphasized for rangeland projects, fencing would be required in several areas to protect special status plant species from grazing by wild horses and livestock. Special status species management objectives would be incorporated into allotment monitoring and evaluation processes, as in all other alternatives.

While the AUM's of forage allocated to wild horses would not change in either herd area, wild horse impacts would still occur. The population of Crosby's buckwheat near Fish Fin in Beaty Butte and possibly Cusick's buckwheat and snowline cymopteris in the Black Hills, would need to be monitored to determine if horses were causing damage. Although horses usually are not in the Black Hills, Cusick's buckwheat and snowline cymopteris monitoring would need to include horse presence and use of area. Hoof action and trails would kill the plants that are barely surviving in these fragile ash habitats.

Nine of the ACEC's (proposed and existing) have special status species growing within them and would be managed, in part, to enhance those values. The added protection of overlapping WSA boundaries exists. In these nine ACEC's, careful consideration

would be given to mitigate or deny authorization of activities that could have a potentially negative effect on the plants or habitats. These actions, combined with conservation agreements, would provide protection for the habitat and individual plant species.

OHV designations in the open class would be less than Alternative A; for the limited class, they would be substantially higher than Alternatives A or B, but less than Alternative C; for closed class, they would be slightly more than Alternatives A or B (Table 4-5). These designations, coupled with an increase in recreation use within areas of high special status plant concentrations, could result in adverse impacts. Recreation use is anticipated to have a moderately adverse effect on special status plants and communities.

Wildland fire management impacts would be the same as Alternative C, with special status plant species considered in all suppression actions. A prescribed fire to help with the reintroduction of desert allocarya at Cave Springs would be proposed.

Locatable mining activities, leasable mineral activities, and mineral material disposal would have the same impacts as Alternative C, except that there would be less area proposed for withdrawal in the Red Knoll ACEC, allowing a possible sight increase in disturbance by mineral extraction, access roads, and other supporting activities.

Issuance of any rights-of-way, leases, or permits would be the same as Alternative A. Adjustments in land tenure would be advantageous to special status plants and would be the same as Alternative C.

### **Alternative E**

Lack of aggressive weed control would have the potential to result in severe long-term adverse impacts to numerous sensitive species, particularly those along roads and trails where vehicle use may import weeds. Noxious weeds would spread into plant sites, physically displacing populations, preventing normal reproductive processes, and causing water competition on ash soil sites.

Absence of livestock grazing would have a beneficial impact on those special status plants currently grazed or trampled by livestock. In addition, livestock as a mechanism for transporting noxious weeds into new areas would be eliminated. With no project development, mining or other similar disturbances, natural processes would benefit special status plant species. Wild horse impacts would be similar to Alternatives B,

C, and D.

If prescribed fire is not allowed, many plant communities that are on the threshold of becoming decadent or desertified would eventually become cheatgrass/medusahead communities or would be overcrowded with shrubs at the expense of the perennial grass/forb understory (Figure 4-1). This action would have a direct impact on special status plants, many of which are already in soils and locations where conditions are marginal for survival. Fire suppression to protect life and property could result in certain sites burning repeatedly within a short time. This may have an adverse effect on plant communities in an early seral stage and would adversely affect some special status species. However, a beneficial impact may be that minimal direct physical damage would occur to plant sites as a result of fire suppression activities.

Lack of recreation management and uncontrolled recreation activities would result in detrimental effects, such as trampling, harvesting damage, and weed introduction in special status species habitats. These effects would occur in areas where recreational activities, such as hiking and camping, are likely to increase.

With cross-country OHV use eliminated, sensitive plant sites would receive full protection from short-term trampling and long-term trails caused by OHV activity. The removal of OHV vehicles in the Sand Dunes would have a positive effect, increasing the possibility that native plants, even special status species, would return to previously disturbed areas.

### **Summary of Impacts**

Under Alternative A, special status plant species and their habitat could continue to improve, although recovery rates and extent of recovery would vary and could be reduced to allow for commodity uses. Mitigation would occur on a case-by-case basis rather than on a watershed or larger scale. While improvements would occur, they would take longer. The major impacts to special status plant species are from wildland fire (short-term impacts and in some cases, depending on plant species, beneficial), the weed management program (long-term impact), grazing impacts from wild horses and livestock, and recreation (especially OHV impacts). The management goals for special status plant species and their habitats could be achieved under this alternative with added protection by fencing. Alternative A would have an overall beneficial impact and would facilitate meeting the objectives for most special status plants and their habitats.

Under Alternative B, in habitats that would be heavily impacted, special status plant species may decline or remain at low levels, potentially contributing to Federal listing of some plant species. Species would be protected individually with little regard for overall habitat health. The objective for special status plants may not be met for species found in heavily impacted areas and where general ecological health is critical to species survival. Overall, this alternative would provide for maintenance of special status plant species, but there is a risk that some species and sites may receive significant adverse impacts and require fencing or other mitigation to meet the objectives.

The overall impact of Alternative C would be positive. Major threats would include OHV activities at the most critical plant sites, management of livestock grazing, and project development placement. All could be mitigated by early planning of activities. Beneficial impacts would be obtained with retention and establishment of ACEC's, because numerous plant populations would be given priority management protection within adequate boundaries for species and habitat representation within a full range of variation. The emphasis on restoration or enhancement would have more importance than protection and maintenance measures. Alternative C would have an overall beneficial impact and would facilitate meeting the objectives for most special status plants and their habitats.

Impacts from Alternative D would be similar to Alternative C, especially with the establishment of new ACEC's; however, recovery rates for special status plant species habitat would require more time to improve. The emphasis would be a balance of protection of habitats and populations with equal weight on restoration and enhancement. The overall impact of Alternative D would be slightly more positive than Alternative A. However, this alternative has several threats to these plants and their communities: the amount of area open to OHV activities, the same livestock grazing goals, increased wildhorse use, and simple ignorance of the special status plants. Plants and activities potentially affecting them would need to be monitored. The ACEC designations would create beneficial impacts, as would restoration plans for impacted habitats. Numerous plant populations would be given priority management protection within adequate boundaries for species and habitat representation within a full range of variation.

Impacts from Alternative E would be similar to Alternative D, but there would be no disturbance from permitted activities and active restoration (there would be no restoration or enhancement and no protective

fences). The overall impact on special status plants would be negative. Although there would be no livestock grazing, there would be negative wildlife and wild horse impacts. Lack of noxious weed control and wildland fire suppression would be critical factors causing displacement of plants at certain sites. During the life of this plan, the management goal for special status plant species and their associated habitats may never be achieved in horse herd areas, areas of repeated wildland fires, and where noxious weeds would not be controlled because of allowing natural processes to determine the outcome of habitat conditions. This could contribute to the Federal listing of some plant species.

### ***Secondary, Indirect, and Cumulative Impacts***

The major secondary, indirect, or cumulative impacts to special status plant species would be habitat degradation or loss (threatening viability of populations), destruction of the plants, and loss of habitat connectivity and variability.

The impacts from activities implemented on the adjacent public lands creates additional cumulative impacts on the landscape scale. Oregon Department of Transportation (ODOT) coordinates with the BLM for spraying of noxious weeds so special status species in vulnerable areas may be protected. The USFS and USFWS contact the BLM for possible joint impacts, such as fence building, road maintenance, and other actions on their respective administered lands. The ONHP is the data steward for the State and the BLM special status plant species; however, it is not involved in management of those species on Federal lands.

Wild horses from outside the Beaty Butte Herd Management Area could constitute a threat to special status plant species as they move from adjacent ownerships. The BLM manages the herds on BLM land and coordinates with the other agencies, but the cumulative effects still occur.

In the writing of conservation agreements, the BLM takes into account the entire range and distribution of a special status plant species. The cumulative effects of "threats" across the entire range of these species is important in creating conservation strategies. An example is grimy ivesia: there are only 31 plants in the planning area; however, on the Sheldon National Antelope Refuge in Nevada, there are a relatively large number of plants. By analyzing all populations and their ecology, conservation strategies could be proposed.

Land use authorizations could result in substantial surface disturbance, whereby special status plants could be indirectly impacted by fragmentation of habitat or introduction of exotic plants from disturbed areas.

One potential threat to special status plants is the gradual warming of the atmosphere and increase of carbon dioxide; this combination could have a long-term impact on sensitive plant species that are finely adapted to their environment. The BLM cannot change these impacts, but would consider them in viewing all impacts on special status plant species.

## Noxious Weeds and Competing Undesirable Vegetation

**Management Goal—***Control the introduction and proliferation of noxious weeds and competing undesirable plant species, and reduce the extent and density of established populations to acceptable levels.*

### *Analysis of Impacts*

#### Alternative A

Projects or activities designed to maintain or improve watershed function, rangeland health, and wildlife habitat would involve ongoing efforts to control weeds to protect/restore plant diversity. Improvements in ecological function would have a positive impact, in that weeds would be less likely to invade, although there would still be some risk of plant establishment. Maintaining and restoring habitat in good condition would reduce the risk of weed invasion. Improved range condition would result in a decreased likelihood of weed establishment and an increased resiliency to weed invasion. Conversely, any resource activity or management action which results in ground disturbance could increase the risk of weed invasion and establishment.

Construction and maintenance of projects, use of heavy equipment, livestock grazing, fire suppression, and recreation activities could all contribute to the spread of existing weeds and the introduction of new species. People, vehicles, equipment, livestock, and wildlife coming from outside the planning area could bring weeds with them and could spread existing infestations. Weeds could be introduced through contaminated seed, mulch, and forage. Cleaning equipment prior to any maintenance or construction activity and before leaving the job site (if the site is already in-

festated) would reduce the risk of seed and plant part movement to other areas. Awarding contracts for projects to local contractors could reduce the risk of introduction and spread of new weeds from outside the planning area.

Ten-mile maintenance buffers between domestic sheep/goats and bighorn sheep would preclude the use of sheep or goats as weed control agents within the buffer area. Weed-infested areas where sheep and goats would be effective in controlling weeds are currently located within this 10-mile buffer. The potential for disease transmission exists for bighorn sheep which stray outside of their occupied habitat if domestic sheep and goats are being used for weed control. A prohibition on the disturbance of raptor nest/roost sites may preclude weed treatment activities within a certain distance from a nest/roost and at certain times of the year.

Deferring grazing following fire would reduce the risk of weed invasion by eliminating a possible mechanism of seed dispersion and the likelihood of increased disturbance, allowing desirable vegetation to become established. Reducing stocking levels, maintaining nonnative seedlings in a vigorously productive state, and rehabilitating projects that do not meet management objectives would decrease the risk of weed invasion and establishment. However, livestock water developments would encourage concentrated use around waterholes, which would likely result in bare ground, providing a site for weed establishment. Once established, the weeds could be easily spread by animals to uninfested areas. Temporary nonrenewable grazing use in weed-infested areas could increase the risk of weed spread. The potential impacts resulting from the authorization of temporary nonrenewable grazing use could be mitigated by not allowing temporary nonrenewable grazing use in weed-infested areas during a time when propagules can be transported elsewhere by livestock or vehicles. The potential impacts resulting from livestock grazing could be mitigated by not allowing livestock in weed-infested areas during a time when propagules can be transported elsewhere. Livestock arriving from outside the planning area could be held in feedlots to allow weed seed to pass through the digestive system and fall off the coat. Requiring certified weed-free seed, mulch, and forage could reduce the risk of weed introduction to new areas.

The maintenance of wild horse numbers and low priority for restoration of poor condition rangelands in the Paisley Desert Herd Management Area would contribute to deteriorated range condition and could

increase the risk of weed invasion and establishment.

Weed control in WSA's and ACEC's would be carried out according to special guidance to protect or enhance resource values. Weeds found on acquired lands which are adjacent to or within existing WSA's that meet wilderness criteria would be aggressively controlled. Weed control would benefit the natural values found in these SMA's.

Prescribed fire would have a beneficial impact as a weed control method and as a tool to stimulate reestablishment of native plants. This would be a part of an integrated weed management prescription to achieve resource objectives. However, some weed species are stimulated by fire and are better able to take advantage of the disturbance than more desirable native plants. Fire suppression activities could introduce weeds when fire equipment and supporting resources are brought in from areas outside the planning area. Existing weeds could be spread to other areas. Emergency fire rehabilitation activities would reduce the risk of weed invasion by reestablishing vegetation on burned sites; however, these activities could potentially introduce or spread weeds through equipment and vehicle use or contaminated seed. Mitigation measures would be implemented to reduce this possibility.

Motorized vehicles could introduce weeds from elsewhere and/or spread existing weeds along ways and trails. Driving cross-country could open up undisturbed areas to weeds spread by vehicles and could establish a conduit for weed movement. However, the increasing demand for recreation would present an increased opportunity to provide weed education materials. Restricting some recreation uses/access could reduce the risk of introduction and the spread of weeds. Allowing organized OHV events would provide an opportunity to educate large groups about weeds. Closing roads decreases the risk of weeds being introduced and spread by vehicles.

All Visual Resource Management (VRM) Class I areas (Map VRM-1 of the Draft RMP/EIS) would require diligent, ongoing inventory and control of weeds. Large weed patches seen from a distance could detract from the visual resource value.

Mining and road construction/maintenance actions could contribute to the spread of existing weeds and the introduction of weed species.

Corridors and rights-of-way tend to be hot spots for weeds. They act as conduits for weed spread and establishment. Acquiring access through weed-infested

properties is possible. Mitigation measures could include locating access routes to avoid weed-infested areas and cooperation with willing landowners to control infestations as access is acquired.

### **Alternative B**

The "Abert Rim Weed Management Area Plan" (USDI-BLM 1995e) would be expanded to provide guidance for the proposed Greater Abert Weed Management Area. This area would include all lands within the Abert Subbasin. The plan would be modeled after the "Warner Basin Weed Management Area Plan" (USDI-BLM 1999g). The Abert Subbasin includes lands of several jurisdictions. Noxious weeds and undesirable plants are invading and expanding in the subbasin (just as they are in other parts of the planning area). The development of a cooperative weed management strategy for the basin would benefit all lands in the subbasin. Presently, the weed infestations are still reasonably manageable. If a cooperative effort to control weeds across the subbasin is not adopted, the weed problem would get much worse. Losses to wildlife habitat, water quality, forage production, silviculture, agricultural production, and recreation values would accelerate.

Projects or activities which maintain or improve watershed function, rangeland health, and wildlife habitat, as well as management actions which result in ground disturbance, would have the same impact described under Alternative A. The emphasis on increased commodity production would provide greater opportunities for weed introduction, spread, and establishment. As such, the weed program would need to become more aggressive with increased efforts in education, prevention, early detection, and control. People, vehicles, equipment, livestock, and wildlife coming from outside the planning area would have the same impact as in Alternative A.

Projects such as fencing, mining, vegetation projects to optimize forage production and use by livestock and wildlife, juniper harvest, increased prescribed fire, and commercial use in the Sunstone Collection Area would cause more disturbance to soil and vegetation and would increase the potential for weed invasion.

Wild horse impacts on weed introduction and expansion would be similar to Alternative A. Even if numbers of horses were reduced, there would likely be a subsequent increase in livestock use with similar impacts on weed introductions and expansion.

OHV, VRM, mining, land tenure, rights-of-way, and

road construction/maintenance actions would have the same types of impact as Alternative A, but would likely be of greater magnitude.

### **Alternative C**

Impacts of developing and implementing the “Greater Abert Weed Management Area Plan” would be the same as described under Alternative B.

Projects or activities which maintain or improve watershed function, rangeland health, and wildlife habitat, as well as activities or management actions which result in ground disturbance, would have the same impact that is described under Alternative A. The emphasis on protection of natural values under this alternative would dictate that the weed program be the most aggressive. A zero-tolerance policy for noxious weeds would result in eradication attempts on all existing sites, increased efforts in inventory and education, and restoration of all weed sites toward the reestablishment of native species.

The actions proposed under this alternative, such as fewer range improvements, less emphasis on providing livestock forage, excluding livestock from streams, springs, and riparian and wetland areas, no temporary nonrenewable grazing use, rehabilitation projects using native species only, removal of roads in riparian areas, increased mineral restrictions, and limiting OHV use to existing roads and trails, would have a positive impact in that these actions would result in a decreased likelihood that weeds would be introduced and existing infestations would be less likely to spread.

Actions pertaining to prescribed fire, wildland fire use, and wild horses would have the same impact as Alternative A.

### **Alternative D**

Impacts of developing and implementing the “Greater Abert Weed Management Area Plan” would be the same as described under Alternative B.

Projects or activities which maintain or improve watershed function, rangeland health, and wildlife habitat, as well as activities or management actions which result in ground disturbance, would have the same impact as Alternative A. Since this alternative strives to strike a balance between protecting and improving natural values while providing commodity production, the weed program would be expanded from present management. Inventory, control, and restoration efforts would increase. Education and outreach

efforts would be expanded to include areas outside of Lake County in an attempt to prevent other species from spreading into the planning area.

Livestock grazing impacts would be similar to Alternative A. Increasing AUM’s for wild horses and increasing the appropriate management level in the Paisley Desert Herd Management Area would cause more disturbance to soil and vegetation and increase the potential for weed invasion and establishment.

Actions pertaining to prescribed fire and wildland fire use would have the same impact as Alternative A.

Actions such as limiting OHV use to designated or existing roads and trails in some areas (Map R-7), removing livestock from streams which are functioning at risk or nonfunctioning, and restricting mineral development (Maps M-8, -9, and -10) would have a positive impact. There would be a decreased likelihood that weeds would be introduced and existing infestations would be less likely to spread.

VRM, land tenure, rights-of-way, and road construction/maintenance actions would have the same types of impact as Alternative A.

### **Alternative E**

Since uses would be limited, commodity production excluded, and natural processes maximized, the impacts to weeds would be both positive and negative. The exclusion of commodity production activities would generally be positive in that there would be fewer opportunities for ground disturbance and transport of plant parts by people and equipment associated with the commodity use. Only high priority noxious weed species and infested areas on BLM land would be treated to prevent spread to adjacent private property.

Activities which maintain or improve watershed function, rangeland health, and wildlife habitat, as well as management actions which result in ground disturbance, would have the same impact that is described under Alternative A. Maintaining roads for administrative access, maintaining existing water developments crucial to wildlife and wild horses, and removing riparian exclosures could result in ground disturbance, which would increase the risk of weed introduction and establishment.

Impacts from wild horses would be the same as described in Alternative D.

The lack of active fire rehabilitation following wild-

land fire could have detrimental effects if the fire passes through a weed-infested area. Many weed species are encouraged by fire and could dominate the site following a fire if no rehabilitation is implemented.

### **Summary of Impacts**

Under all alternatives, the introduction and spread of weeds would continue. Any management action which results in ground disturbance could increase the risk of weed invasion and establishment. The degree to which the introduction and spread of weeds can be controlled varies by alternative. In Alternative A, weeds would continue to invade from areas outside the planning area, though the size and number of existing infestations could decrease with continued treatment. In Alternative B, there would be an increased risk of weed introduction and establishment because of increases in commodity production that would bring additional equipment and people to the area, possibly bringing weeds from elsewhere or spreading existing infestations. In Alternative C, the short-term risk of weed introduction and establishment would be high as restoration projects were implemented, disturbing the ground surface. In the long term, the risk of weed invasion would decrease as improvements in ecological function occur. Under Alternative D, the risk of weed introduction and establishment could decrease as inventory, control, and education efforts are expanded. The impact in Alternative E would be mixed. The exclusion of permitted uses and commodity production could provide less opportunity for weed introduction and establishment. However, the lack of restoration and fire rehabilitation could lead to an increase in weeds spread.

### **Secondary, Indirect, and Cumulative Impacts**

At the present time, the Fremont National Forest does not have a comprehensive, well-established weed management program. As a result, the forest would continue to be a source of weed infestation since the headwaters of many of the streams on the planning area are located on the forest. Weed seeds would continue to travel downstream onto BLM-administered lands.

If the injunction against the use of certain herbicides is lifted in the future, it would facilitate the control and eradication of weeds on BLM-administered lands. However, it is likely that regardless of the methods used to control weeds, their introduction and spread would continue for the foreseeable future.

## **Soils and Microbiotic Crusts**

**Management Goal—Manage soil and microbiotic crusts on public lands to maintain, restore, or enhance soil erosion class and watershed improvement. Protect areas of fragile soil using best management practices (BMP's).**

### **Analysis of Impacts**

The lack of specific data from the planning area makes impact analysis difficult, if not impossible. However, there is some scientific evidence that is pertinent. Ponzetti (2001) states that “. . . biotic crust responses to recovery from grazing in Oregon appear similar to that of other arid and semi-arid ecosystems.” This data “. . . demonstrates overall effects of grazing on lichen and bryophyte soil crusts of Oregon, rather than merely site-specific responses. Slightly lower mean species richness of crusts was found in the currently grazed pastures.” This is consistent with data from other parts of the western continental United States and Australia. In general, “. . . biotic crusts from shrub steppe habitats in Oregon are likely to develop greater species richness if they are protected from livestock grazing. However, the magnitude of that difference and the years of protection required to realize an increase in richness remains unknown and may vary from site to site.”

Ponzetti found lower crust cover in currently grazed sites. This is consistent with research in the southwestern United States but has not been documented for the Columbia or Northern Great Basins. “Since biotic crusts are known to increase soil stability and reduction in biotic crust cover and surface roughness increases the potential for soil loss. Other functional attributes of crusts may be affected by reduced cover, including contributions of nutrients and soil organic matter.” They concluded that within the study region, “. . . biotic soil crust communities are more sensitive to livestock disturbance than vascular plant communities.” If the data being collected by ecological site inventory or other research is similar to these conclusions, microbiotic crust analysis may need to become an integral part of rangeland health assessment and in future management decisions.

### **Alternative A**

BMP's (Appendix D) are implemented on a case-by-case basis and are not always applied. As a result, impacts to soils can occur from the construction or maintenance of roads, range improvements, and other surface-disturbing projects. Impacts include soil

compaction from vehicle, livestock, or wild horse use and loss of soil offsite by wind and water erosion. Soils currently in poor condition in the Paisley Desert and Sheeprock areas would remain a low priority for restoration and would possibly get worse.

Domestic livestock and wild horses would continue to have negative impacts to soils by increased compaction at waterholes and along trails. Overuse of vegetation could degrade soil conditions. Areas with poor soil conditions would remain in poor condition. Livestock grazing has a different effect on crusts depending on soil types. Livestock use that does not implement rest/rotation strategies that minimize frequency of surface disturbance during dry seasons and maximizes periods between disturbances may need to be changed to reduce impacts to biological soil crusts (Belnap et al. 2001). Little information exists on the effects of horse populations on biological crusts; however, hoof disturbances along regular trails could cause long-lasting loss of crust cover.

Both prescribed fire and wildland fire remove vegetation and microbiotic crusts which could lead to increased soil erosion. Wildland fires tend to burn at higher temperatures than prescribed fires and could sterilize the soil, killing soil microbes, destroying seed sources, and volatilizing soil nutrients such as nitrogen. Areas burned by wildland fire would be rehabilitated on a case-by-case basis. Burned areas would be rested from livestock grazing for a minimum of two growing seasons. This would eventually provide vegetative cover and reduce soil erosion.

Soil compaction and erosion would occur in localized areas with high concentrations of recreation users, such as developed or primitive campgrounds.

Leaving a high percentage of the planning area open to OHV use (Table 4-5) could have an impact on soils. Vehicles would be able to drive off existing roads and ways, which would result in soil compaction, thereby slowing or preventing water infiltration and causing erosion.

Soils would be impacted by continued mining activity at the existing Tucker Hill Perlite Mine west of Valley Falls, the Oil-Dri diatomaceous earth mining operation in Christmas Valley, and the sunstone mining claims in Warner Valley, as well as mining proposals that could arise in the future (Table 4-6). Soils could be removed offsite or lost to erosion. To minimize this impact and to aid in reclamation of mined sites, soil would be stockpiled onsite and seeded, as needed, to stabilize soil movement and retain organic matter.

Using the ICBEMP road density classification, current road density in the planning area is very low to moderate (ranging from 0.02 to 1.7 miles of road per square mile; Map R-4 of the Draft RMP/EIS). This road density level would not have a significant impact on soils, except in localized areas where roads pass through highly-erodible soils. The projected level of new road construction and average annual road maintenance levels would not cause a significant impact on soils.

### **Alternative B**

Implementing BMP's (Appendix D) on all projects would reduce impacts to soils. Restoration of areas in poor condition, such as Paisley Desert and Sheeprock, would be a high priority under this alternative. Such restoration would improve soil conditions.

Increased livestock use would increase soil compaction, especially around watering and salting areas, and would reduce vegetation cover and litter. These actions would increase soil erosion potential. Wild horse impacts would be similar to Alternative A.

Prescribed fire and wildland fire impacts would be similar to Alternative A. However, the impacts of prescribed fire would be up to three times greater.

Recreation and OHV use would have a similar impact as Alternative A.

Mining activity would impact soils similar to Alternative A. However, the magnitude of impact would be greater (Table 4-6). Any stockpiled soil for reclamation would be seeded to provide a vegetation cover to reduce offsite soil loss from the stockpiles due to wind and water erosion during the life of the mining operation.

Road closures would be few under this alternative, but would help to reduce soil compaction and potential erosion in localized areas. Additional road construction and maintenance and right-of-way use, to support commodity-related activities, would minimally increase soil impacts.

### **Alternative C**

Improvements to soil condition would be greatest under this alternative. Watershed improvement for both function and processes would enhance soil conditions in most cases. Restoration of areas in poor condition, such as the Paisley Desert and Sheeprock areas, would be a high priority. Such restoration would improve soil

conditions. Use of BMP's would be required on all soil-disturbing projects. Fewer projects would be completed. This would reduce loss of soil during construction, as well as reduce soil loss from erosion after the project is finished.

Reduced livestock grazing levels could retain adequate plant litter to maintain soil productivity and limit erosion. Progress toward attaining desired range of conditions would be accelerated. Wild horse impacts would be similar to Alternative A.

Total protection from disturbance would be the easiest way to improve microbiotic soil crusts, but this is not often possible or desirable. However, protection of relic sites as rangeland reference areas would provide important baseline comparisons for ecological potential and future scientific research. While biotic crusts have not been the main criteria for proposing ACEC's, the proposed areas would be less disturbed, allowing for the crusts to recover naturally from damage caused by off-road vehicles and livestock grazing. The benefits from healthy microbiotic crusts are nutrient inputs, better water infiltration and soil surface stability, and in some cases, healthy biocrusts prevent invasion of small-seeded invasive plant species (Belnap et al. 2001).

Impacts of wildland fire would be similar to Alternative B. Impacts of prescribed fire would be similar to Alternative A, but of greater magnitude than Alternatives A or B.

Recreation impacts would be similar to Alternative A. All OHV use would be limited to existing or designated roads and trails. Off-road driving of any kind would not be allowed. This would prevent development of new trails, soil compaction, and new erosion sources. Microbiotic crusts would have a greater chance to recover to ecological potential.

Mineral exploration and development activity would be highly restricted (Table 4-6); therefore, impacts to soils would be minimal.

The greatest number of existing roads would be closed under this alternative (Table 4-4). This would reduce soil compaction and erosion potential, especially in some watersheds. New road construction and road maintenance actions would have similar impacts as Alternative A.

#### Alternative D

Improvements to soil condition would be greater than

Alternatives A or B, but less than Alternative C. Restoration of areas in poor condition, such as the Paisley Desert and Sheeprock areas, would be a high priority. Such restoration would improve soil conditions. Use of BMP's would be required on all potential soil-disturbing projects. This would reduce loss of soil during construction, as well as reduce soil loss from erosion after the project is finished.

Livestock grazing impacts on soils would be similar to Alternative A. Wild horse impacts would be similar to Alternative A, but of greater magnitude due to increased horse numbers.

Recreation impacts would be similar to Alternative A. Impacts to soils from OHV use could be significant. Approximately 56 percent (Table 4-5; Map R-7) of the planning area would be open to cross-country travel, which would result in increased soil compaction and erosion potential.

Mining activity would be restricted in many ways (Maps M-8, -9, and -10) and would have impacts similar to Alternative C (Table 4-6). On any mineral exploration or development activity, topsoil would be stockpiled and used for later reclamation. Stockpiled soil would be seeded to reduce loss to wind or water erosion.

Road closures (Table 4-4) would decrease soil compaction and erosion, especially in some watersheds. New road construction and road maintenance actions would have similar impacts as Alternative A.

#### Alternative E

BMP's would be implemented for all soil-disturbing projects. However, very few new projects would be done. Areas currently in poor condition in the Paisley Desert and Sheeprock areas would remain a low priority for improvement and would possibly get worse.

With the removal of livestock grazing, the condition of soils previously impacted could recover over time. Deposition of plant litter and incorporation of organic matter into the soil would increase across the landscape, resulting in increased soil productivity, decreased erosion from overland flow, and progress toward the desired range of conditions. On sites dominated by native species, rates of water, nutrient and energy cycling, and soil movement would be restored to near historic levels. Sites supporting shallow-rooted exotic annual species would continue in a degraded condition.

Table 4-4.—Miles of roads proposed for closure within special management areas <sup>1</sup>

Area	Alternative					Reasons
	A	B <sup>2</sup>	C <sup>2</sup>	D <sup>2</sup>	E <sup>2</sup>	
Existing areas of critical environmental concern						
Devils Garden ACEC/WSA <sup>3</sup>	11.4	11.4	35.1	11.6	11.4	WSA/big game
<i>Permanent</i>						
<i>Seasonal</i> <sup>4</sup>	0.0	0.0	0.0	40.0	0.0	Big game
Lake Abert/Abert Rim ACEC/WSA <sup>3</sup>	6.4	6.4	22.3	9.7	6.4	WSA resources
Fossil Lake/Sand Dunes/Lost Forest ACEC/RNA/WSA <sup>3</sup>	23.0	23.0	54.4	25.1	23.0	WSA/cultural and paleontological resources
Warner Wetlands ACEC						
<i>Permanent</i>	30.6	30.6	67.7	30.6	30.6	Wildlife/erosion
<i>Seasonal</i>	4.8	4.8	0.0	4.8	4.8	Erosion
Proposed areas of critical environmental concern						
Black Hills ACEC/RNA	1.9	1.9	6.8	3.7	1.9	Botanical resources/erosion
Connley Hills ACEC/RNA	0.0	0.0	6.0	4.1	0.0	Botanical resources/erosion
Fish Creek Rim ACEC/RNA/WSA <sup>3</sup>	5.8	5.8	12.8	7.9	5.8	WSA
Foley Lake ACEC/RNA	0.0	0.0	0.3	0.2	0.0	Botanical resources/cultural resources
Guano Creek/Sink Lakes ACEC/RNA/WSA <sup>3</sup>	0.2	0.2	2.6	2.6	0.2	WSA/botanical resources/erosion
Hawksie-Walksie ACEC/RNA/WSA <sup>3</sup>	3.7	3.7	14.2	7.8	3.7	WSA/cultural resources
High Lakes ACEC	0.0	0.0	23.0	17.8	0.0	Cultural resources
Juniper Mountain ACEC/RNA	0.0	0.0	6.7	4.3	0.0	Botanical resources/erosion
Rahilly-Gravelly ACEC/RNA	0.0	0.0	11.3	0.0	0.0	Botanical/cultural resources/ erosion
Red Knoll ACEC	0.0	0.0	7.3	3.8	0.0	Cultural resources/riparian resources
Spanish Lake ACEC/RNA	0.0	0.0	4.4	0.6	0.0	Botanical resources/erosion
Table Rock ACEC/RNA	0.3	0.3	11.4	3.9	0.3	Botanical/cultural resources/erosion
Other areas						
Cabin Lake/Silver Lake Deer Winter Range Cooperative						
Seasonal Road Closure Area <sup>4</sup>	159.0	159.0	239.1	243.4	0.0	Big game
Buck Creek Watchable Wildlife Site	0.4	0.4	0.4	0.4	0.4	Wildlife/erosion
Cougar Mountain	1.7	1.7	1.7	1.7	1.7	Big game
Crane Mountain	0.7	0.7	0.7	0.7	0.7	Cultural/botanical resources/erosion

Area	Alternative					Reasons
	A	B <sup>2</sup>	C <sup>2</sup>	D <sup>2</sup>	E <sup>2</sup>	
Green Mountain	0.4	0.4	0.4	0.4	0.4	Botanical resources
Westside Gravel Pit	0.2	0.2	0.2	0.2	0.2	Cultural resources
Twelvemile Creek WSR	0.0	0.0	0.2	0.2	0.0	WSR resources
Alkali Lake Sand Dunes	0.0	0.0	0.0	0.0	0.0	
<b>Wilderness Study Areas</b>						
Four Craters	16.5	16.5	16.7	16.7	16.5	WSA resources
Sage Hen Hills	0.0	0.0	2.1	2.1	0.0	WSA resources
Squaw Ridge	9.7	9.7	9.7	9.7	9.7	WSA resources
Diablo Mountain	35.1	35.1	39.0	39.0	35.1	WSA resources
Spaulding	21.7	21.7	21.7	21.7	21.7	WSA resources
Orejana	10.1	10.1	10.1	10.1	10.1	WSA resources
Basque Hills	7.1	7.1	7.1	7.1	7.1	WSA resources
Rincon	1.7	1.7	1.7	1.7	1.7	WSA resources
<b>Totals</b>						
<i>Permanent</i>	188.6	188.6	399.1	246.5	188.6	
<i>Seasonal</i>	163.8	163.8	239.1	288.2	4.8	

<sup>1</sup> Mileage values are calculated from road data within geographic information systems.<sup>2</sup> Closure total includes miles historically closed under Alternative A.<sup>3</sup> Includes WSA overlap with the ACEC.<sup>4</sup> Closure is seasonal from December 1 to March 1 each year; the remainder of the year OHV's are limited to existing roads and trails.

Short-term impacts to soil could occur as existing rangeland projects are abandoned and removed. In the long term, areas disturbed during project removal would be stabilized by natural revegetation. However, areas around water holes would recover more slowly, depending on the extent of historic impacts.

Wild horses would have negative impacts to soils similar to Alternative A. Areas with poor soil conditions would remain in poor condition.

The impacts of wildland fire would be similar to Alternative A. However, human-caused wildland fire may increase as recreational activity increases, resulting in increased impacts to soils.

Impacts to soils from recreation activities would increase within areas of concentrated activity, including primitive sites and developed facilities.

All OHV use would be limited to existing roads and trails. Off-road driving of any kind would not be allowed. This would prevent development of new trails, soil compaction, and new erosion sources. Limited maintenance of existing roads could increase impacts as a result of the normal breakdown of roadbeds, wet-weather rutting by vehicles, and channeling of runoff.

### **Summary of Impacts**

BMP's would be implemented for all ground-disturbing activities, such as new projects, fences, road maintenance, and pipelines (Appendix D). The soil management objective would be met under all the alternatives; however, Alternative C would provide the greatest amount of protection to soils, followed by Alternative D.

The greatest potential impacts to soils would be off-road vehicle use, mineral development, and new road construction. The likelihood of new, large scale mineral development is low under all alternatives. Very little new road construction would be expected, since there has been virtually none in the past 20 years.

### **Indirect, Secondary, and Cumulative Impacts**

Watershed condition, including soils, on public lands have improved since the late 1800s. With the implementation of BMP's as standard operation procedures under all alternatives, this improvement would continue. However, there are some upland soil conditions that would not recover without active restoration. Such restoration projects are described within several other

resource management sections in various alternatives.

Soil, vegetation, and watershed conditions are intricately tied together. While improving one component can help improve the others, the greatest benefit comes from the synergistic effect of improving all components concurrently. It is the intent of this plan that the synergistic, positive effects would be carried through the life of the plan and beyond.

## **Water Resources/Watershed Health**

**Management Goal 1—*Protect or restore watershed function and processes which determine the appropriate rates of precipitation capture, storage, and release.***

**Management Goal 2—*Ensure that surface water and groundwater influenced by Bureau of Land Management (BLM) activities comply with or are making significant progress toward achieving State of Oregon water quality standards for beneficial uses, as established by the Oregon Department of Environmental Quality (ODEQ).***

### **Assumptions Common to Alternatives**

- Water quality management plans or total maximum daily loads would improve watershed health.
- The CWA would be implemented through the use of BMP's (Appendix D) and the future development of water quality management plans.
- Management activities that improve vegetation in uplands and riparian areas would decrease flood magnitude and frequency and improve late season flows.
- Native plant communities would capture, store, use, and release water in a manner which decreases erosion.
- A correlation exists between the amount of compaction in a watershed and the number of miles of roads and trails present.

### **Analysis of Impacts**

**Direct impacts:** The indicators of change for direct impacts to watershed health are: (1) the percentage of

a watershed in potential natural plant communities and (2) the amount of compacted land surface present. Upland plant communities are currently being inventoried to determine what communities are present and each community's condition. This process is called ecological site inventory. An estimate can be made of plant communities and their condition for areas where no inventory data currently exists, but the estimate would be updated with the ecological site inventory information when available. The amount of compacted area in the watershed would be estimated by the number of miles of roads and trails present. If a watershed has many roads and trails, it would also have borrow pits, foot trails, recreation sites, and other compacted areas in relative proportion to the amount of roads and trails. Road density would be used as a surrogate for estimating the amount of compaction in a given watershed.

**Risk analysis:** The data necessary to analyze the indicators of change for direct impacts is currently being collected for some parts of the planning area and cannot always be estimated for Alternatives B through E. This impact analysis would look at the risk of proposed management based on total number of acres managed, ability of management to change the vegetation community, and ability of management to increase compaction of bare soil. While some management actions could have a wide range of effects, more acres affected or more intense management would increase the risk of changing the vegetation community, increasing compaction, and increasing the amount of bare soil. One example would be OHV use. The risk to watershed function would increase with the amount of acres open to off-road travel. Not all use would cause a decrease to watershed function, but the risk would exist.

### ***Impacts Common to All Alternatives***

All alternatives would comply with the CWA by managing for restoration and maintenance of the physical, biological, and chemical integrity of the water in the planning area. This would include management striving to meet Oregon State water quality standards and implementing BMP's. This would provide the baseline resource protection and would protect watershed health. Over time, the condition of watersheds would improve.

There are about 261,500 acres of relatively unmanaged land within the planning area. This area would have little or no recreation, roads, mining, and grazing management. This allows for the natural capture, storage, and release of precipitation. These lands

would have a very low risk of management changing the rate of infiltration or soil water storage capacity.

### ***Alternative A***

The shrub steppe community management goals and actions focus on maintaining current conditions and use. Restoration would occur on a case-by-case basis. This would not move the upland watershed vegetation communities toward potential natural condition. This would have a risk of changing the rate and ability of watersheds to capture (infiltration rate), store (soil pore space), and release (plant use or water subsurface movement) water. This alternative would maintain the existing upland watershed condition, including areas in poor condition in the Sheep Rock and Paisley Desert areas.

The riparian and wetland vegetation management goals and actions focus on achieving proper functioning condition on a minimum of 75 percent of the area. Restoration would be on a case-by-case basis. Proper functioning condition would be the first step toward achieving the desired range of conditions. However, it would not achieve the potential natural condition or desired future condition. Maintenance of existing and construction of new spring developments would increase the risk to watershed function by increasing water consumption and compaction by domestic livestock, wild horses, and wildlife. Modification of spring developments to allow water to return to riparian areas would improve watershed function. Construction and maintenance of water developments in intact playas and lakebeds would put these systems at risk of negative impacts to water capture, storage, and release because of increased compaction, loss of vegetation, and damage to the impermeable layer.

Western juniper woodlands management goals and actions focus primarily on meeting public demand for juniper products. However, juniper removal or treatment could benefit many aspects of watershed health. Juniper sites have consistently low water infiltration rates, indicating high surface runoff flows, high kinetic energies, and high erosion potentials (Buckhouse and Gaither 1982). Sites with low interspace vegetation cover (mid-successional and old growth woodland stages) have exponentially higher sediment and erosion potentials than sites with greater ground cover from more uniformly dispersed vegetation (Gaither and Buckhouse 1983). Juniper encroachment may impact hydrologic cycles (Wall et al. 2001). Juniper effectively intercept rain and snow before it hits the ground surface (Young and Evans 1984; Larsen 1993). Intercepted snow is subject to sublimation. Within invaded

aspen stands, this can result in less water retained in the snowpack underneath the trees compared to the amount found under a pure aspen stand (Johnson 1971). Conifers also use more water than aspen (Gifford et al. 1983, 1984; Jaynes 1978). Without BMP's, there would be an increased risk of negative effects to watershed function (capture, storage, and release) due to changes in vegetation communities and increased compaction.

The special status plant species management goals and actions focus on individual species. This management would not achieve ecological or watershed goals and thus would have risks for negative impacts on watershed function.

The noxious weeds (and competing undesirable vegetation management) goals and actions focus on integrated management. The populations of noxious weeds would have increased negative effects on watershed function by decreasing the amount of water captured and increasing the use of water onsite.

The water resources and watershed health management goals and actions focus on maintaining current conditions and use. This would put watershed function at risk due to the use of minimum standards for road building and other management actions. Restoration would be on a case-by-case basis without the use of watershed analysis. Because BMP's are prescribed on a case-by-case basis without long-term effectiveness monitoring, there would be a risk to watershed function.

The fish and aquatic habitat management goals and actions focus on instream and near stream condition and use. Protection of fish habitat, riparian areas, and streams would support a healthy watershed.

The wildlife and special status animal species management focuses on maintenance, restoration, or enhancement of habitat. This would support watershed function by moving vegetation and soil conditions closer to potential natural community. However, managing for a single species could put watershed function at risk because an ecological, holistic approach would not be used, and the interaction of watershed function and multiple species needs to be addressed.

The livestock grazing management actions would continue to authorize 108,234 AUM's for livestock grazing. Temporary nonrenewable grazing use would also be allowed. While this could be achieved with no negative impacts to watershed function, there currently are areas with poor vegetation and soil conditions. In

these areas, there would continue to be negative impacts to watershed function.

The wild horse management goals and actions focus on continuation of horse use at existing levels within two existing herd management areas near Paisley and Beaty Butte. Wild horses have negative impacts to watershed function by increased water consumption and compaction at water holes. Overuse could degrade vegetation and soil conditions. Currently, there are areas within the herd management areas with poor vegetation and soil condition negatively impacting watershed function. Because the restoration of poor condition, unhealthy rangelands in the Paisley Desert would remain a low priority, negative effects would possibly get worse.

The SMA management goals and actions focus on maintaining the current number of SMA's. Special management areas are at lower risk of damage to watershed function than areas under multiple use management. There would be a risk for negative impacts to watershed function.

The fire management goals and actions focus on suppression, rehabilitation, and fuels reduction treatments. Treatments would occur on 10,000 to 20,000 acres annually. Negative impacts could occur with fire suppression and mechanical treatments due to increased compaction. There would be a risk for negative impacts to watershed function.

The recreation management goals and actions focus on maintaining current conditions and uses, with development in response to public demand. This alternative would have a significant area open to OHV's (Table 4-5). This use would increase the risk of compaction and degraded vegetation or soil condition. This would have a risk for negative impacts to watershed function.

The energy and minerals management goals and actions focus on maintaining current conditions and use. This use would increase the risk of compaction and degraded vegetation or soil condition. This would have a risk for negative impacts to watershed function.

The lands and realty management goals and actions focus on maintaining current conditions and use. Land adjustments which acquire land in good watershed condition would improve overall watershed function. Implementation of rights-of-way for new roads and utility corridors would increase the risk of compaction and degraded vegetation or soil condition. These actions would have a possibility of both improving and degrading watershed function.

The roads and transportation management goals and actions focus on maintaining current conditions and use. Closing roads not needed or causing resource damage would be considered on a case-by-case basis. New road construction and road maintenance would increase compaction and degrade vegetation within and near the road bed. Current road density, by subbasin, is shown on Map R-4 of the Draft RMP/EIS. This would have a risk for negative impacts to watershed function, but that risk would be decreased with the closure and obliteration of unneeded roads.

### **Alternative B**

The shrub steppe community management goals and actions focus on improving forage for livestock grazing. The restoration goal would increase forage on degraded landscapes. This would not move the upland watershed vegetation communities toward potential natural community. The desired range of condition for the shrub steppe would be a range of vegetation communities, including those not in potential natural condition. This would have a risk of changing the rate and ability of the watershed to capture (infiltration rate), store (soil pore space), and release (plant use or water subsurface movement) water. This alternative would maintain the upland watershed condition. There would be a risk to watershed functions because the amount of compaction and water use by plants has been altered, negatively affecting watershed functions. The risk would be greater than under Alternative A.

The riparian and wetland vegetation management goals and actions focus on achieving proper functioning condition. Restoration would occur on a case-by-case basis but would not interfere with commodity production. Impacts would be similar to Alternative A, though the risk would be less than Alternative A.

The western juniper woodlands management goals and actions focus on maximizing allowable commercial and public harvest. There would be an increased risk of negative effects to watershed function due to increased compaction. Harvesting trees in a drainage would also increase the risk of changing subsurface flow to surface flow, possibly increasing surface erosion. The risk would be greater than under Alternative A.

The special status plant species management goals and actions focus on individual species and would not achieve ecological or watershed goals. Thus Alternative B would have risks for negative impacts on watershed function, but this risk would be similar to Alternative A.

The noxious weeds (and competing undesirable vegetation) management goals and actions focus on integrated management, increased inventory, and education. Populations of noxious weeds and competing undesirable vegetation could increase, thus causing a negative effect on watershed function. The risk would be less than under Alternative A.

The water resources and watershed health management goals and actions focus on maintaining current conditions and protection of riparian conservation areas. This would put watershed function at risk due to using minimum standards for road building and other management actions. Restoration would be on a case-by-case basis without the use of watershed analysis. Because BMP's would be used on a case-by-case basis without long-term effectiveness monitoring, there would be a risk to watershed functions. The focus of management in the riparian conservation area would not protect uplands, thus there would be a risk to watershed functions. The risk would be less than Alternative A.

The fish and aquatic habitat management goals and actions focus on instream and near stream condition and use. Protection of fish habitat, riparian areas, and streams would support a healthy watershed, but would not protect uplands; thus there would be a risk to watershed functions. The risk would be greater than Alternative A.

The wildlife and special status animal species management focuses on maintenance, restoration, or enhancement of habitat. This would support watershed function by moving vegetation and soil conditions closer to potential natural community. Managing for a single species could put watershed functions at risk because the interaction of watershed function and multiple species would still need to be addressed. The risk would be the same as Alternative A.

The livestock grazing management actions would authorize up to 119,057 AUM's for livestock grazing and would optimize temporary nonrenewable grazing use. This would increase the risk of negative impacts to watershed functions. The risk would be greater than Alternative A.

The wild horse management goals and actions and risk of negative impacts would be similar to Alternative A.

The SMA goals and actions focus on increasing the number of SMA's by adding Connley Hills with an increase in total acreage of SMA's. These areas would be at lower risk of damage to watershed function than

areas under multiple-use management. This alternative would have a risk for negative impacts to watershed function, but it would be slightly less than Alternative A.

The fire management goals and actions focus on suppression, rehabilitation, and fuel reduction treatments. Treatments would occur on up to 64,000 acres annually. With the increase of fuel treatment, there should be a decrease in wildland fire suppression. There would be more impacts from mechanical treatments than prescribed fire. Negative impacts could occur with fire suppression and mechanical treatments due to increased compaction. There would be a risk for negative impacts to watershed function. The risk would be greater than Alternative A.

The recreation management goals and actions focus on increasing tourism and recreational use. The impacts would be similar to Alternative A (Table 4-5), though the risk for negative impacts to watershed function would be greater than Alternative A.

The energy and minerals management goals and actions focus on maximizing the mineral exploration and development. This would increase the risk of compaction and degraded vegetation or soil condition. This alternative would have a risk for negative impacts to watershed function. Revoking the public water reserve withdrawals would decrease the ability to provide for public multiple use and would increase single private use. The area around Lake Abert, especially the north end, would be impacted by removal of lake-level and total dissolved solids stipulations on mineral leasing. Any development or extraction of lakebed evaporites would negatively impact water resources of Lake Abert by changing the water cycle of the lake and altering the water chemistry. This alternative would have a risk for negative impacts to watershed function. The risk would be greater than Alternative A.

The lands and realty management goals and actions focus on maintaining current conditions and increasing area that could be used for other public purposes. Emphasizing land tenure and access acquisition for commodity production could preclude acquisition of high resource value property and result in missed opportunities to facilitate management of watershed health. New rights-of-way could have a negative effect due to land disturbance from construction and increases in compaction and impacts to vegetation condition. Expansion of powerline corridors to 2,000 feet could have substantial negative effects due to the increased size of the potential disturbance area. This alternative

would have a risk for negative impacts to watershed function. The risk would be greater than Alternative A.

The roads and transportation management goals and actions focus on maintaining current conditions and use. New road construction and road maintenance would increase compaction and degrade vegetation within and near the road bed. This alternative would have a risk for negative impacts to watershed function. The risk would be greater than Alternative A. Closing roads would reduce areas of soil compaction and potential erosion sources.

### Alternative C

The shrub steppe management goals and actions focus on restoring and maintaining a diverse composition and structure of vegetation. From a watershed perspective, restoring degraded conditions would move the upland watershed vegetation communities toward potential natural condition. Implementation of this alternative could maintain and improve upland watershed condition. Implementation of Alternative C has less risk than Alternatives A or B.

The riparian and wetland vegetation management goals and actions focus on identification and development of riparian management objectives. Restoration would be on a case-by-case basis. This would move watersheds toward achieving the desired range of conditions. Rehabilitation of developed springs would return flows to channels that would improve watershed function. Determining feasibility of wetland restoration in lakebeds and playas could improve watershed function. Removing roads from riparian conservation areas would allow full development of floodplains and reduce sediment loads, improving watershed condition. Implementation of Alternative C would have less risk than Alternatives A or B.

The western juniper woodlands management goals and actions focus on protection of resource values. This would move juniper ecosystems toward potential natural community. There would be a risk of negative effects to watershed function due to increased compaction. Harvesting trees in drainages would also increase the risk of changing subsurface flow to surface flow, thereby increasing erosion. The risk would be less than Alternatives A or B.

The special status plant species management goals and actions focus on restoration and enhancement and create new SMA's. This management would move toward ecological or watershed goals and thus would have a low risk for negative effects on watershed

function. The risk would be less than Alternatives A or B.

The noxious weeds (and competing undesirable vegetation) management goals and actions focus on a zero tolerance for noxious weeds. The populations of weeds would decrease, which would have a positive effect in restoring watershed function. The risk would be less than Alternatives A or B.

The water resources and watershed health management goals and actions focus on reducing current impacts and maintaining good condition. This would restore watershed function due to decreased road densities, grazing near streams, springs and wetlands, and uses in drainages where activities would adversely impact watershed function. The risk would be less than Alternatives A or B.

The fish and aquatic habitat management goals and actions focus on instream and near stream condition and use and connectivity. Protection of fish habitat, riparian condition, streams, and the watersheds that support them would support healthy watershed function. The risk would be less than Alternatives A or B.

The wildlife and wildlife habitat management of special status animal species focuses on maintenance, restoration, or enhancement of ecosystems. This would support watershed function by moving vegetation and soil conditions closer to potential natural community. The risk would be less than Alternatives A or B.

The livestock grazing management actions would authorize about 20 percent fewer AUM's for livestock grazing. While this could be achieved with no negative impacts to watershed function, there would be a risk of negative impacts to watershed functions. The risk would be less than Alternatives A or B.

The wild horse management goals and actions focus on continuation of horses using rangelands near Paisley and Beaty Butte. Wild horses would have negative impacts to watershed function by increased water consumption and compaction at waterholes, and overuse, which could degrade vegetation and soil conditions. There would be a risk for negative impacts to watershed functions. The risk would be the same as Alternative B, but less than Alternative A.

The SMA's goals and actions would increase the acreage of areas under special management. Areas in special management would be at lower risk of damage to watershed function than areas under multiple-use management. The amount of use allowed, such as

grazing or recreation, would increase the risk of compaction and degradation of vegetation or soil condition. This alternative would have a decreased risk for negative impacts to watershed function. The risk would be less than Alternatives A or B.

The fire management goals and actions focus on limited suppression, native seed rehabilitation, and fuels reduction up to 640,000 acres. With the increase of fuel treatment, there should be a decrease in wild-land fire suppression over the long term. Fuels treatment would emphasize prescribed fire. Negative impacts could occur with fire suppression and mechanical treatments due to increased compaction. The risk would be less than Alternatives A or B.

The recreation management goals and actions focus on maintaining and enhancing natural values. With none of the resource area designated open to OHV use, this alternative would begin to restore watershed function. The risk would be less than Alternatives A or B.

The energy and minerals management goals and actions decrease the amount of land open to mining. This would decrease the risk of compaction and degradation of vegetation or soil condition but would not entirely eliminate it. This alternative would have a risk for negative impacts to watershed function. The risk would be less than Alternatives A or B.

The lands and realty management goals and actions focus on improving current resource conditions and use. Land adjustments would acquire land in good watershed condition and improve overall watershed function. Implementation of rights-of-way for road building and utility corridors would increase the risk of compaction and degradation of vegetation or soil condition. There would be an increase in areas where rights-of-way are excluded. This would have a greater possibility of improving rather than degrading watershed function. The risk would be less than Alternatives A or B.

The roads and transportation management goals and actions focus on protecting resource values. Closing roads no longer needed or causing resource damage would be considered on a case-by-case basis. BMP's would be used for new road construction and maintenance. Roads would increase compaction and degradation of vegetation within and near the road bed. This alternative would have a risk for negative impacts to watershed function, but this would decrease with protection of resources. The risk would be less than Alternatives A or B.

### Alternative D

The shrub steppe management goals and actions focus on restoring and maintaining natural values while providing forage production. Restoration of degraded conditions would occur on a watershed level. This would move upland watershed vegetation communities toward potential natural condition. This could maintain and improve upland watershed condition. Implementation would have a greater risk than Alternative C, but less risk than Alternatives A or B.

The riparian and wetland vegetation management goals and actions focus on identification and development of riparian management objectives. Restoration would be on a case-by-case basis. This would move the watershed toward achieving the desired range of conditions. Not allowing new water developments in intact playas and lakebeds would decrease the risk of negative impacts to watershed functions. Removing roads, which negatively impact streams within riparian conservation area, would allow full development of floodplains and reduce sediment loads improving watershed condition. Alternative D would have a greater risk than Alternative C but less risk than Alternatives A or B.

The western juniper woodlands management goals and actions focus on protection of resource values. This would move juniper ecosystems toward potential natural conditions. The implementation of harvest BMP's would protect watershed functions. Alternative D would have a greater risk than Alternative C but less risk than Alternatives A or B.

The special status plant species management goals and actions focus on restoration and enhancement and create new SMA's. This management would move toward ecological or watershed goals and thus would have a low risk for negative effects on watershed function. Alternative D would have the same risk as Alternative C but less risk than Alternatives A or B.

The noxious weed (and competing undesirable vegetation) management goals and actions focus on an integrated approach. The populations of weeds would decrease over time and have a positive effect on restoring watershed function. Alternative D would have a greater risk than Alternative C but less risk than Alternatives A or B.

The water resources and watershed health management goals and actions focus on reducing current impacts and maintaining good condition. This would move toward restoring watershed function due to implemen-

tation of BMP's, minimum standards for upland grazing, and evaluation of near stream grazing. Alternative D would have a greater risk than Alternative C but less risk than Alternatives A or B.

The fish and aquatic habitat management goals and actions focus on protection and restoration of instream and near stream condition. Protection of fish habitat, riparian condition, streams, and the watersheds that support them would promote healthy watershed function. Alternative D would have a greater risk than Alternative C but less risk than Alternatives A or B.

The wildlife and management of special status animal species focuses on maintenance, restoration, or enhancement of ecosystems. This would support watershed function by moving vegetation and soil conditions closer to potential natural community. Alternative D would have the same risk as Alternative C but less risk than Alternatives A or B.

The livestock grazing management actions would authorize 108,234 AUM's for livestock grazing and allow temporary nonrenewable grazing use. While this could be achieved with no negative impacts, there would be a risk of negative impacts to watershed functions. Alternative D would have a greater risk than Alternative C but less risk than Alternatives A or B.

The wild horse management goals and actions focus on the continuation of horses using rangeland near Paisley and Beatty Butte. Wild horses would have negative impacts to watershed function by increasing water consumption and compaction at waterholes, and overuse, which could degrade vegetation and soil conditions. There would be a risk for negative impacts to watershed functions. Alternative D would have a greater risk than Alternative A, which would be greater than Alternatives B and C.

The SMA goals and actions would increase the acreage of areas under special management. Areas in special management would be at a lower risk of damage to watershed function than areas under multiple use management. The amount of use, such as grazing or recreation, would increase the risk of compaction and degradation of vegetation or soil condition. This would have a decreased risk for negative impacts to watershed function. Alternative D would have a greater risk than Alternative C but less risk than Alternatives A or B.

The fire management goals and actions focus on limited suppression, native seed rehabilitation, and fuels reduction on up to 480,000 acres. With the increase of fuel treatment there should be a decrease in

wildland fire suppression over the long term. Negative impacts could occur with fire suppression and mechanical treatments due to increased compaction. Alternative D would have a greater risk than Alternative C but less than Alternatives A or B.

The recreation management goals and actions focus on maintaining and developing recreational uses. This alternative would have a large percentage of the planning area open to OHV use (Table 4-5; Map R-7). This alternative would have a greater risk of negatively impacting watershed function than Alternative C but much less than Alternatives A or B.

The energy and minerals management goals and actions decrease the amount of land open to mining from the current level. This would decrease the risk of compaction and degradation of vegetation or soil condition, but would not eliminate it entirely. This alternative would have a risk for negative impacts to watershed function greater than Alternative C but less than Alternatives A or B.

The lands and realty management goals and actions focus on maintaining current resource conditions and use. Land adjustments would acquire land in good watershed condition and improve overall watershed function. New rights-of-way for road building and utility corridors would increase the risk of compaction and degradation of vegetation or soil condition. There would be an increase in areas where rights-of-way are excluded. This alternative would have a greater possibility of improving rather than degrading watershed function. Alternative D would have a greater risk than Alternative C but less than Alternatives A or B.

The roads and transportation management goals and actions focus on protecting resource values. Closing roads no longer needed or causing resource damage would be considered on a case-by-case basis. BMP's would be used for new road construction and maintenance. Roads would increase compaction and degradation of vegetation within and near the road bed. This alternative would have a risk for negative impacts to watershed function, but this would decrease with protection of resources. Alternative D would have the same risk as Alternative C but less than Alternatives A or B.

### **Alternative E**

The shrub steppe management goals and actions focus on natural restoration. This would move most upland watershed vegetation communities toward potential natural community. This alternative could maintain

and improve upland watershed condition. Some vegetation communities would not move towards desired range of condition. Alternative E would have a greater risk than Alternatives C and D but less risk than Alternatives A or B.

The riparian and wetland vegetation management goals and actions focus on natural restoration. This would move watersheds toward achieving the desired range of condition. Alternative E would have less risk than Alternative C, which would be less than Alternatives D, A, or B, respectively.

The western juniper woodlands management goals and actions focus on natural restoration. This would move watersheds toward achieving the desired range of conditions. Alternative E would have less risk than Alternative C, which would be less than Alternatives D, A, or B, respectively.

The special status plant species management goals and actions focus on restoration and protection with no new SMA's. This would move toward ecological or watershed goals and thus would have a low risk for negative effects on watershed function. Alternative E would have a greater risk than Alternatives C and D but less risk than Alternatives A and B.

The noxious weed (and competing undesirable vegetation) management goals and actions are limited. Populations of weeds would increase and have a negative effect on watershed function. Alternative E would have a greater risk than all other alternatives.

The water resources and watershed health management goals and actions focus on natural restoration. This would move most upland watershed vegetation communities toward potential natural community. This alternative could maintain and improve the upland watershed condition. Some vegetation communities would not move toward desired condition. Alternative E would have a greater risk than Alternative C but less risk than Alternatives A, B, or D.

The fish and aquatic habitat management goals and actions focus on natural restoration. Long-term restoration of fish habitat, riparian condition, streams, and the watersheds that support them would promote healthy watershed function. Alternative E would have less risk than all other alternatives.

The wildlife and special status animal species management focuses on natural restoration. This would support watershed function by moving vegetation and soil conditions closer to potential natural community.

Alternative E would have less risk than Alternatives C and D, which would be less than Alternatives A and B.

There would be no permitted livestock grazing. This would reduce the risk of negative impacts from livestock grazing. Alternative E would have less risk than Alternative C, which would be less than Alternatives D, A, or B, respectively.

The wild horse management goals and actions focus on continuation of horses using rangeland near Paisley and Beaty Butte. Wild horses would have negative impacts to watershed function by increased water consumption and compaction at waterholes, and overuse, which could degrade vegetation and soil conditions. There would be a risk for negative impacts to watershed functions similar to Alternative D, which would have a greater risk than Alternatives A, B, and C, respectively.

There would be no SMA's or commodity use. The risk of damage to watershed function would be minimal because of the decrease in commodity uses. Alternative E would have less risk than Alternative C, which would be less than Alternatives D, B, and A, respectively.

Fire management actions would focus primarily on suppression and protecting life and property. As a result, fire suppression activities would be reduced. Negative impacts could occur with fire suppression due to increased compaction of soils from equipment. Alternative E would have less risk than Alternative C, which would be less than Alternatives A and D, which would be less than Alternative B.

The recreation management goals and actions focus on maintaining or minimizing current use. This alternative would have no acres designated open to OHV's. This alternative would help restore watershed function. Alternative E would have less risk than Alternative C, which would be less than Alternatives D, A, and B, respectively.

The energy and minerals management goals and actions would withdraw the entire planning area from mining. This would significantly reduce the risk to watershed function. Alternative E would have less risk than Alternative C, which would be less than Alternatives D, A, or B, respectively.

The lands and realty management goals and actions focus on maintaining current land status with a small amount of disposal possible. The entire planning area would be excluded from the location of new rights-of-way. This would reduce the risk to watershed function.

Alternative E would have less risk than Alternative C, which would be less than Alternatives D, A, or B, respectively.

The roads and transportation management goals and actions focus on maintaining existing road system. Closing roads no longer needed or causing resource damage would be considered on a case-by-case basis. BMP's would be used for a very limited amount of new road construction and maintenance. Roads would increase compaction and degraded vegetation within and near the road bed. This alternative would have a risk for negative impacts to watershed function, but this would decrease with protection of resources. Alternative E would have a greater risk than Alternative C, which would be the same as Alternative D, but less than Alternatives A or B.

### ***Summary of Impacts***

Under Alternative A, water resources and watershed health could continue to improve, although recovery rates and extent of recovery would be reduced to allow for commodity uses, including livestock, transportation, and recreation. Management would continue on a case-by-case, site-specific basis with less consideration for watershed-scale effects. The management goals for water resources and watershed health would be difficult to achieve under this alternative.

Impacts from Alternative B would be similar to Alternative A because of law and policy ("Endangered Species Act," CWA, etc.) setting a high minimum standard. Because of the priority on commodity production, the risk of negative impacts would increase, as would the cost and effort of implementation. Minimally acceptable conditions would be required, and mitigation would occur on a case-by-case basis rather than on a watershed scale. While improvements could occur, they would take longer and not be as extensive as under Alternative A. The management goal for water resources and watershed health would be more difficult to achieve under this alternative than Alternative A.

Impacts from Alternative C would be much less than under Alternative A. Recovery rates would be much faster and the final results would be better for water resources and watershed health conditions. Watershed scale effects at the levels specified in Alternative C would result in more stable conditions. The management goal for water resources and watershed health would be achieved under this alternative.

Impacts from Alternative D would be less than under

Alternative A. Impacts of implementation of water resources and watershed health guides would be similar to Alternative C, including BMP implementation, but with less stringent direction to restore watershed function and processes. More consideration would be given to watershed scale-effects than under current management. The management goal for water resources and watershed health could be achieved under this alternative.

Impacts from Alternative E would be less than under Alternative A, except for noxious weeds. Without disturbance from commodity production and permitted uses, water resources and watershed health would, in most cases, quickly improve and progress to a later successional plant community. However, some habitats would need active restoration, such as headcut stabilization, or vegetation restoration to achieve recovery within the 15- to 20-year lifespan of this plan. The management goal for water resources and watershed health could be achieved under this alternative.

### ***Secondary, Indirect, and Cumulative Impacts***

Management which has or could affect the ability to achieve water resource and watershed health goals include past, present, or future land-disturbing activities in a given watershed. This would include activities which take place on adjacent ownerships, such as past grazing, timber harvest, or road building. The complex system of water diversions, including dams, diversions, canals, and the draining and ditching of wetlands all have had cumulative effects on BLM lands. These activities would be considered when decisions are made on BLM management. The cumulative effects would be similar for all alternatives.

Since the late 1800s, the overall watershed health of the public lands has improved. The damage can still be observed in streams as increased peak flows, decreased base flows, and increased sediment loads and loss of fish habitat. The damage to upland vegetation and soil conditions is still occurring in systems that can not recover without changes in current management, including active restoration.

Noxious weeds and competing undesirable vegetation is the one area that has not improved since the late 1800s. This situation overshadows the desired conditions and changes the path of potential plant communities in some areas. It also can prevent attainment of desired conditions if not controlled on adjacent lands.

## **Fish and Aquatic Habitat**

**Management Goal—*Restore, maintain, or improve habitat to provide for diverse and self-sustaining communities of wildlife, fish, and other aquatic organisms.***

### ***Assumptions***

- The analysis of effects on stream habitat would also represent effects on lake or reservoir habitat.
- Management activities that improve vegetation in uplands and riparian areas are assumed to decrease flood magnitude and frequency and to improve late season flows. Additionally, improvement in riparian/wetland vegetation would have a direct improvement on fish and aquatic habitat.
- Effects of water quality management plans or total maximum daily loads on fish habitat would be positive under all alternatives.
- Implementation of the “Recovery Plan for the Native Fishes of the Warner Basin and Alkali Subbasin” (USFWS 1998) would be beneficial for all native fish in the Warner Subbasin, as would compliance with biological opinions for the Warner sucker.

### ***Analysis of Impacts***

#### ***Alternative A***

Commercial forest management would have minimal impacts to fish and aquatic habitats, due to the low amount of commercial forestlands in the planning area and their location compared to habitats. While some increase in runoff and sediment could be expected, they could be reduced by following mitigation and current harvest standards. By improving ground cover, juniper management would benefit fish and aquatic habitats as runoff and erosion were reduced. Juniper management associated with riparian/wetland habitats would have a direct beneficial effect and could increase flows at springs (refer to Management Goal 2, Forest and Woodlands and the Water Resources/Watershed Health section of this chapter). The current prohibition of juniper management in Deep, Twentymile, and Twelvemile Creek Canyons would continue to allow degradation of the uplands and associated stream conditions in this portion of the planning area.

Where special status plant habitats are associated with fish and aquatic habitats, considering the effects to the special status species would decrease impact to the associated fish and aquatic habitat. However, emphasizing management based on individual species instead of habitats could limit the amount of possible improvement.

Weed control would have positive effects on fish and aquatic habitats by improving ground cover and decreasing competition with more desirable riparian/wetland plant species.

Improving ecological conditions would benefit aquatic habitats by reducing flood frequency and flow, increasing infiltration, and extending flows later into the season. Improving ecological conditions along streams and other riparian habitats would have direct improvement to these habitats. The extent of impacts from vegetation manipulation would be determined on a case-by-case basis, depending on the implementation method and location. While vegetation manipulation projects could have short-term negative impacts as ground is disturbed (such as by fire and disking), and runoff and sedimentation increases, there should be long-term positive impacts as ground cover increases, thereby reducing runoff and sedimentation. Watershed condition improvement is based on specific problem areas rather than by entire watersheds, so additional watershed-level effects from sediment production and flood events would be greater than potential. Limiting improvement based on proper functioning condition would minimize the improvement potential of fish and aquatic habitats over what would be possible based on site potential, especially if the improvement is focused on the riparian/wetland site instead of the overall watershed. As discussed in Chapter 2, proper functioning condition would only be a beginning point, with the desired range of condition usually being a much more advanced state. Setting objectives based on proper functioning condition only could preclude development to the full site potential of the habitat.

Management designed to improve water quality and to meet ODEQ standards would result in improved watershed, stream conditions, and water quality, as well as improved fish and aquatic habitats. The goal of reducing summer temperatures would result in less stress to stream resident fish, thus improving survival rates. Reduced sediment loads would improve spawning gravels.

Fish and aquatic habitats associated with special status animal species habitats for listed, candidate, and Bureau species would benefit from targeting the special

status species habitat for improvement, including implementation of conservation agreements and recovery plans. Emphasizing individual species management over habitat or watershed level management would reduce the extent and level of improvement. Emphasizing individual species could have the effect of benefitting one species over another, which could alter the amount of improvement to fish and aquatic habitat.

Current exclosures and grazing systems have improved many riparian areas, and this improvement would be predicted to continue. Limiting livestock use on bitterbrush to meet deer winter range needs could result in lighter riparian use and would be beneficial to fish and aquatic habitats. Livestock exclosures have maximized riparian improvement and recovery rates to the extent possible without structural work, so maintenance of the exclosures would be beneficial.

Impacts to fish and aquatic habitats from livestock grazing authorization are site-specific and closely tied to impact on associated vegetation. Direct impact to banks from trampling and hoof action, as well as water contamination from livestock waste products, could also occur. Current livestock management has improved conditions on most aquatic habitats; however, on some springs and streams, the grazing authorization continues to have an adverse impact. The sites that are adversely affected are usually small, isolated reaches more often associated with private lands. Authorization of temporary nonrenewable grazing use prevents "excess" vegetation from being left for ground cover and litter development. This prevents enhancement of watershed conditions and fish and aquatic habitat. Limiting new livestock water developments in playas would protect the habitats of the aquatic species that depend on the natural conditions.

There are no perennial fish habitats associated with wild horse herd management areas. Wild horses use the herd management areas year-round and impact some seasonal riparian/aquatic habitats negatively, especially the springs in the Beaty Butte Herd Management Area. Confining horses to herd management areas would prevent damage to sites outside these areas. Control of horse numbers would have some beneficial effect, but because of concentration of use on the springs, the effect would be limited as damage occurred from a minimal amount of season-long use, and any additional use by greater numbers would have little additional effect. Unless riparian sites were addressed specifically, restoration of poor condition, unhealthy rangelands in the Paisley Desert Herd Management Area would have little effect. Mainte-

nance and construction of water developments for horses could be disruptive to aquatic habitats. Fence construction to control wild horse use could be beneficial to aquatic habitats.

Current ACEC and RNA designations would have no effect on fish and aquatic habitats. Interim protection of outstandingly remarkable values for potential WSR's could preclude some management actions beneficial to fish and aquatic habitats, such as instream structures and watershed-level vegetation management, especially juniper treatments.

Limiting land-disturbing activities within identified Native American religious sites or traditional cultural properties could preclude some activities, such as vegetation manipulation, land exchange, or structural improvement, that would be beneficial to fish and aquatic habitats. Traditional uses may impact fish and aquatic habitats by vegetation removal.

The effect of making contracts for services and sale of products available to local firms would be site-specific. However, if competition is limited, the cost of projects to improve fish and aquatic habitats could be greater so fewer projects would be developed. Continuing commodity production levels could result in excessive use in some areas and continued facility operation—especially some roads—could result in channel effects and sedimentation.

Recreation activities in the Warner Wetlands Special Recreation Management Area could have some effect on fish and aquatic habitat, but the effects would be limited if current activity levels continue. Because use tends to concentrate around aquatic habitats, recreation activities could have negative effects through channel alteration and vegetation removal. Effects from the development of recreation sites, tourism, and special recreation permits would be site-specific and could be minimized by design. Controlling public use with special recreation permits would be beneficial.

OHV use has site-specific impacts that could be severe when associated with fish and aquatic habitats. Even though OHV control is limited, specific closures and limitations in existing ACEC's and WSA's would be beneficial. More diverse effects occur at the watershed scale and could result in increased sediment production. No specific areas have been identified as having impacts from OHV's, but there are numerous areas of use scattered across planning area. Some of these areas are on two-track trails not in the transportation plan, and others are on open areas and hillsides.

Managing VRM Class I areas (primarily WSA's) could preclude some management actions beneficial to fish and aquatic habitats, such as instream structures and watershed-level vegetation management, especially juniper treatment.

Impacts from locatable mineral development and exploration would depend entirely on the location of the work. Prospecting would have little impact. Exploration could result in surface disturbance, including road construction. Increased sediment production could be expected. Mine development could result in increased runoff, sediment, and water contamination. The extent of impact would depend on the location of the mine in proximity to aquatic habitats. Existing developments at Tucker Hill, Sunstone Area, and Christmas Valley diatomite operations would have little effect on fish and aquatic habitats. Instream suction dredging could increase sediment production, alter width/depth and other channel characteristics, and disturb or remove shoreline vegetation.

Because of the ability to adjust site development to avoid fish and aquatic habitats, oil and gas leasing should have little impact unless the access roads to the sites or cross-country travel and exploration occur in these habitats. In these cases, sediment could be increased and vegetation disturbed. Geothermal exploration and development would have similar impacts as oil and gas, but an additional concern would be the effects development could have on groundwater aquifers that supply springs. Effects could occur both to temperature and flow of springs, thus altering the associated aquatic habitat. Foskett Spring is of special concern.

Exploration for sodium salts could have impacts to the aquatic habitats associated with the development of drill pads and roads, especially around Abert Lake. Development of a sodium mine would impact a much larger area and would lower lake levels, altering the water availability for shoreline vegetation. The springs near the lake, including XL Spring, could be impacted by lowered water tables and plant construction and operation. While minimum lake levels are prescribed by the current plan (USDI-BLM 1996d), lowering the lake to these levels in 1 year could result in even lower levels in following years because of low input due to drought or increased irrigation demand. Wells developed to support mine operations could have a direct impact to shoreline springs. Impacts would depend on the location of the plant and the direction and location of access and shipping routes.

Impacts from salable mineral development would

depend on the location of the development but should be minimal, based on the ability to modify location of the site. Reclamation of sites would improve ground cover, reducing erosion and runoff potential, and could be beneficial to fish and aquatic habitats.

Land tenure adjustments could improve fish and aquatic habitats. The acquisition of parcels along Twelvemile Creek would allow instream improvements to benefit fish and aquatic habitats. Right-of-way development could have negative effects with increased sediment production and vegetation removal and disturbance. Depending on the location and type of right-of-way, mitigation could minimize effects. For example, rights-of-way involving roads would have greater impacts than small power lines. Access acquisition could be beneficial if it facilitated access for management of fish and aquatic habitats; however, increased sediment and runoff could result.

Minimum standards for roads and other construction activities would provide minimal protection for fish and aquatic habitat from degradation due to erosion and sedimentation. Closing selected roads would have localized positive effects, if doing so reduced runoff and erosion. The road closures and rehabilitation could restore flood plain functioning and reduce direct channel impingement.

### **Alternative B**

The effects resulting from public and commercial use of juniper would depend on harvest criteria and restrictions/BMP's placed on harvest.

This alternative introduces the concept of riparian conservation areas management that would be beneficial to fish and aquatic habitat. Setting a desired range of conditions would be beneficial by recognizing the potential of the site. Improving ecological conditions along streams and other riparian habitats would have direct improvement to these habitats, but the improvement would be restricted by the emphasis on commodity production. Prohibiting water right acquisition could preclude opportunities for fish habitat improvement.

Optimizing forage production implies more extensive use would result in less ground cover and increased impacts to aquatic habitats. Impacts from livestock grazing would be site-specific and closely tied to impacts to associated vegetation. If additional forage from adjustment of appropriate management levels is allocated to livestock, the improvement to aquatic habitats (associated primarily with springs) would be

reduced over nonallocation. However, livestock could be managed to provide seasonal rest or deferment, so some improvement could be expected. Emphasizing project construction over grazing management actions could reduce the rate and extent of potential improvements. Construction of additional water developments could have a direct negative impact to aquatic habitats. Allowing new livestock water developments in playas could have negative impacts to the aquatic habitats associated with intact lakes. Spring function improvement would occur but would be limited because of the emphasis on commodity production. Corridor fencing of streams would increase maintenance and cost, but would result in substantial improvement to currently grazed streams.

Optimizing the authorization of temporary nonrenewable grazing use would preclude excess vegetation from being left for ground cover and litter development and further enhancement of watershed conditions and fish and aquatic habitat.

Emergency fire rehabilitation should be beneficial by reducing soil loss and sediment production by fire line rehabilitation and increased ground cover; however, the allocation of additional forage to livestock would reduce benefits. Prescribed fire impacts would be similar to, but of greater magnitude than, Alternative A.

Recreation and OHV impacts would be similar to Alternative A; however, maximizing OHV events could increase impacts to fish and aquatic habitats from additional erosion and sedimentation, resulting in a loss of clean gravel spawning sites.

The springs near Lake Abert, including XL Spring, could be impacted by lowered water tables and directly impacted by the plant construction and operation associated with mineral leasing, especially since current restrictions for minimum lake level would be lifted. Wells developed to support mine operations could have a direct impact to the shoreline springs. Impacts would depend on the location of the plant and direction and location of access and shipping routes. The lack of restrictions on mining and mineral leasing could result in negative effects to fish and aquatic habitats, should development occur on undisturbed lands.

Emphasizing land tenure adjustments for commodity production could result in lost opportunity to acquire valuable aquatic habitats through exchange. Construction of new and expansion of existing powerline corridors to 2,000 feet could have substantial negative effects due to the increased size of the potential distur-

bance area.

Road closures could improve fish and aquatic habitats if they reduce runoff and erosion, but limiting closures to those that would not impact commodity resources could limit the improvement. Implementing BMP's during new road construction and maintenance would minimize impacts to these habitats.

### **Alternative C**

Juniper management would benefit fish and aquatic habitats, improving ground cover and reducing runoff and erosion. Juniper management in riparian/wetland habitats would have a direct beneficial effect and could increase flows at springs; from a watershed level, it would provide increased and longer-lasting stream flows. (Refer also to the Water Resources/Watershed Health section of this chapter.) Limiting stand treatment to 10 percent by wood cutting could reduce benefits. Limiting treatment to 50 percent of stands with fire would reduce benefits. Some areas would need treatment other than by fire to be effective.

Managing special status plant habitats based on a desired range of conditions and considering landscape-level effects would stabilize improvement trends and allow for better long-term conditions compared to management emphasizing individual species.

Increased emphasis on weed control would benefit aquatic and fish habitat through improvement in overall watershed conditions.

Setting standards for watershed and soil conditions would allow determination of progress toward meeting those standards. Managing for improvement on a watershed scale would result in more stable conditions and improved fish and aquatic habitats. Allowing only uses that promote progress toward attainment of instream processes would have direct beneficial effects, especially on the watershed scale. Acquisition of water rights for conversion to instream flows would have substantial benefits by stabilizing flows and maximizing riparian conditions. Designation and management of riparian conservation areas would be beneficial to fish and aquatic habitat.

Considering nongame species could result in additional positive effects to fish and aquatic habitats over concentrating on game species only. Many wildlife species in the Great Basin are dependent on riparian habitat for all or part of their life cycle needs. Improving conditions for all wildlife species should relate directly to fish and aquatic habitat improvements.

Minimizing forage production and range improvements could improve fish habitat by reducing direct impacts from grazing, especially effects from water developments. Following BMP's for grazing or eliminating this use from areas not meeting objectives would improve fish and aquatic habitats. Impacts from livestock grazing would be site-specific and closely tied to impacts to associated vegetation. Beneficial effects to fish and aquatic habitats would occur from grazing systems that maximize improved riparian conditions.

Allowing excess forage (that could have been authorized under temporary nonrenewable grazing use) to remain ungrazed would increase ground cover and litter development, reduce overland flow of water and resulting erosion, and have a beneficial effect on watershed conditions and fish and aquatic habitat.

Rehabilitation of developed springs would return flows to channels that would create additional habitats for aquatic species. One example of this is the development at Falls Spring, where most flow is diverted to a trough, but spring snails are located in the natural outflow channel left with the remaining water. Returning more flow to the channel would create a more secure and better habitat. Determining feasibility of wetland restoration in lakebeds and playas could lead to improved aquatic habitats.

Wild horse impacts would be similar to Alternative A.

Recreation impacts would be similar to Alternative A. Restricting OHV use to existing roads and trails could benefit some fish aquatic habitat or prevent problems from occurring in the future. At Twelvemile Creek, OHV's have eroded a hillside, which is creating a direct sediment input to the stream. Preventing OHV use would allow the site to heal and would stop further erosion and site degradation.

Managing VRM Class I (WSA's) and Class II (WSR's) areas could constrain some management actions beneficial to fish and aquatic habitats, such as instream structures and watershed level vegetation management, especially juniper treatment.

Effects from restricting mineral development (Tables 3-7 and 4-6) would depend on the location of the restriction, but the effect could be very beneficial.

Limiting rights-of-way to designated corridors would minimize additional impacts to fish and aquatic habitat. Acquisition of high resource value lands, including riparian/wetland habitat, would be beneficial.

Access acquisition could be beneficial if it facilitated management of fish and aquatic habitats; however, if new roads are constructed to complete access, increased sediment and runoff could result. The use of BMP's would minimize these effects.

Closing roads would reduce sedimentation and improve aquatic habitats. With few exceptions, impacts to fish habitats from roads (that could be moved) are not great in the planning area. Removing roads from riparian conservation areas would allow full development of flood plains and reduce sediment loads, improving fish and aquatic habitats.

#### **Alternative D**

Juniper management would improve ground cover and benefit fish and aquatic habitats as runoff and erosion were reduced. Juniper management associated with riparian/wetland habitats would have a direct beneficial effect and could increase spring flows. (Refer also to the Water Resources/Watershed Health section of this chapter.)

Managing special status plant habitats based on desired range of conditions and landscape-level effects would stabilize improvement trends and allow for better long-term conditions overemphasizing management based on individual species.

Management designed to restore water quality would result in improved watershed, stream conditions, and water quality, and would improve fish and aquatic habitats. Acquisition of water rights for conversion to instream flows would have substantial benefits by stabilizing flows, maintaining water in habitats, and maximizing riparian conditions. Setting objectives based on site potential would be beneficial. Designation and management of riparian conservation areas and establishing a desired range of conditions would be beneficial to fish and aquatic habitat. Considering watershed-level effects and setting objectives based on desired range of condition would be beneficial.

Considering nongame species across most areas could result in additional positive effects to fish and aquatic habitats over concentrating on game species only. Many wildlife species in the Great Basin are dependent on riparian habitats for all or part of their life cycle needs. Improving conditions for all wildlife should relate directly to fish and aquatic habitat improvements.

Livestock grazing would have impacts similar to Alternative A. However, following BMP's for grazing

or eliminating this use from areas not meeting objectives would improve fish and aquatic habitats. Existing exclosures have maximized riparian improvement and recovery rates, so maintenance of the exclosure would be beneficial. Spring function improvement would occur but would be limited because of the requirement to supply livestock water. Determining feasibility of wetland restoration in lakebeds and playas could lead to improved aquatic habitats. Limiting new livestock water developments in playas would protect the habitats of the aquatic species that depend on the natural conditions.

Wild horse numbers would increase compared to other alternatives, but because of the concentration of use on the springs, this effect would be limited, as damage occurs from a minimal amount of season-long use and the additional use by greater numbers would have little added impact. Increasing horse numbers in the Paisley Desert Herd Management Area would result in little change in impact to aquatic habitats. Maintenance and construction of water developments for horses could be disruptive to aquatic habitats. By controlling use on aquatic habitats, fences could be beneficial. Seeding or erosion control could provide some benefit to aquatic habitats.

Recreation impacts would be similar to Alternative A. Restricting OHV use in portions of the planning area (Table 4-5; Map R-7) could benefit some fish aquatic habitat or prevent problems from occurring in the future. This benefit would be greater than Alternatives A or B but less than C.

Managing VRM Class I (WSA's) and Class II (Twelvemile Creek WSR) areas could constrain some management actions beneficial to fish and aquatic habitats, such as instream structures and watershed level vegetation management, especially juniper treatments.

Impacts from energy and mineral resource development would be similar to Alternative C (Tables 3-7 and 4-6; Map M-8, -9, and -10).

Limiting rights-of-way to designated corridors would minimize additional impacts to fish and aquatic habitats. Access acquisition could be beneficial if it facilitated management of fish and aquatic habitats; however, if new roads are constructed, increased sediment and runoff could result. Use of BMP's would minimize these effects. Acquisition of high value resource lands, including riparian/wetland habitat, would be a positive impact.

Additional road closures could improve fish and aquatic habitats if they reduce runoff and erosion. The closures and rehabilitation could restore flood plain functioning and reduce direct channel impingement.

### **Alternative E**

Allowing only natural processes to restore watershed and ecological conditions would allow recovery to occur, but at a slower rate than using active restoration techniques, especially in pool and spawning gravel developments. Reduction of soil erosion and associated siltation of spawning areas could be reduced.

Lack of juniper management would result in decreased ground cover as the juniper canopy closed. Sediment production would increase and quaking aspen stand conversions would continue. Some springs and their associated aquatic habitat would decline as juniper dewatered the springs. The effects of juniper encroachment would occur at a watershed scale. (Refer also to the Water Resources/Watershed Health section of this chapter.)

Allowing only natural processes to define vegetation composition would allow the spread of weeds that could reduce ground cover and replace more desirable riparian vegetation. Sites that would respond to active woody vegetation plantings would be delayed in recovery.

Elimination of livestock use would allow full development of riparian vegetation at a faster rate. Increased willow and other woody vegetation cover would stabilize banks and provide increased shading and cover.

Wild horse impacts would be similar to Alternative A. Maintenance and construction of water developments for horses could be disruptive to aquatic habitats. Removing interior fencing in herd management areas could result in additional use and degradation of fish and aquatic habitats.

Lack of spring development maintenance would eventually lead to the failure of the development, the return to a natural spring function and, in many cases, increased riparian habitat.

No active rehabilitation after wildland fire could reduce ground cover and increase sediment production. Water quality and fish habitat would be negatively impacted by increased sedimentation and water temperatures.

Recreation impacts would be similar to Alternative A. Restricting OHV use to existing roads and trails throughout most of the planning area (Table 4-5) could benefit some fish aquatic habitat or prevent problems from occurring in the future. This benefit would be similar to Alternative C.

Elimination of mineral entry, energy and mineral leasing, and mineral material disposal would preclude any impacts to fish and aquatic habitat from such activities.

No option is provided for acquiring new habitats, so sites that could be better protected under Federal ownership could be lost and habitat degradation could occur. Right-of-way exclusion would preclude any impacts to fish and aquatic habitat. Loss of access rights and not developing new access roads would preclude any impacts to fish and aquatic habitat.

Minimum road maintenance or closures would result in substantial increases in sediment production and subsequent siltation of spawning beds in the short term. Over time, sediment production would decrease or stop, and there would be an overall decrease in siltation. Construction of only those new roads required by law would be beneficial by reducing sediment production and promoting full flood plain development.

### **Summary of Impacts**

Under Alternative A, fish and aquatic habitats would continue to improve, although recovery rates and extent of recovery would be reduced by commodity uses, including livestock grazing, roads, and recreation. Management would continue on a case-by-case basis on a site-specific level with less consideration for watershed-scale effects. The management goal for fish and aquatic habitats could be achieved under this alternative.

Impacts from Alternative B would be similar to Alternative A. Because of law and policy ("Endangered Species Act," CWA, etc.) providing minimum protection standards, the difference in effects between Alternatives A and B would be minimal, even though commodity uses would be emphasized. Generally, minimally acceptable conditions would be required, and mitigation would occur on a case-by-case basis rather than on a watershed scale. While improvements would occur, they would take longer and not be as extensive as would occur under Alternative A. The management goal for fish and aquatic habitats could be achieved under this alternative, although at a much

slower rate.

Impacts from Alternative C would be much less than Alternative A. Recovery rates would be much faster and would result in better fish and aquatic habitat conditions. Giving consideration to watershed-scale effects would result in more stable conditions. The management goal for fish and aquatic habitats would be achieved sooner and would be the most desirable for these resource values compared to all other alternatives.

Alternative D, impacts of water resources and watershed health guidance, would be similar to Alternative C, including BMP implementation, but with less stringent direction to restore watershed function and processes. There would be less improvement to fish and aquatic habitat than Alternative C. More consideration would be given to watershed-scale effects than under Alternatives A or B. The management goal for fish and aquatic habitats could be achieved under this alternative, the results would not be as fast, nor progress as far as under Alternative C, but it would be faster than Alternatives A or B.

Alternative E would have mixed effects. Without disturbance from commodity uses, fish and aquatic habitats would, in most cases, quickly improve and progress to a later successional plant community. However, some degraded habitats would need some type of active restoration, such as head cut stabilization, to prevent loss of habitat or recovery within the life of the plan. Watershed scale effects would also be mixed, with natural recovery of uplands progressing well but increased juniper encroachment continuing to degrade watershed conditions and impact fish and aquatic habitats. The management goal for fish and aquatic habitats could be achieved under this alternative. This alternative would achieve goals at a rate and end point similar to Alternative C, except on areas needing active restoration.

### **Secondary, Indirect, and Cumulative Impacts**

Actions that have a cumulative effect on watershed function, especially in relation to the watershed's ability to capture, store, and slowly release water, would ultimately impact fish and aquatic habitat. On most forested watersheds in the planning area, the "... equivalent clear cut acres cumulative watershed effects ..." model evaluations indicate that timber harvest and road construction, along with channel incision and channelization, have resulted in increase flood flows, increased frequency of floods, and floods that occur earlier in the season. The Deep Creek, Silver Creek,

and Chewaucan Watershed assessments/analyses (USDA-FS and USDI-BLM 1998b; USDA-FS 1997b; 1999) have demonstrated these changes to some degree in these watersheds. The change in the hydrograph has impacted channel form and thereby, fish and aquatic habitat. The cumulative effects that led to current watershed conditions are now being reversed as forest health improvements are implemented. The cumulative effect of these projects would build over time to return to better fish and aquatic habitat conditions.

Irrigation development has impacted both habitat and fish directly. Water withdrawal increases water temperature and may at times dewater streams removing any fish habitat available. Past diversion structures and channelization have fragmented habitats by preventing fish access to some stream habitats or by preventing access to more secure water in times of drought. For instance, the connection between Honey Creek and Hart Lake is blocked by several diversions that do not allow adequate fish passage, and the diversions are not screened to prevent fish from moving into irrigation channels and subsequently being stranded in fields. Major modifications to Deep and Twentymile Creeks have resulted in the loss of connectivity between these streams and Crump Lake. Most of the diversion structures could be modified to improve connectivity and still provide for irrigation.

Lack of fire has impacted vegetative communities by increased sagebrush and conifer (mainly western juniper) invasion. As canopy cover closes, ground cover from grasses and forbs is reduced, decreasing infiltration and reducing late-season flows. Increased erosion and sediment loads may impact spawning sites. Grazing has added to this process by removing fine fuels, reducing fire size and frequency, and by reducing competition, enabling better establishment of sagebrush and conifers.

The introduction of predatory game fish to the planning area has affected the ability of native fish to thrive and, in some cases, survive. Crappie, bass, and bullhead in Warner Valley have reduced the ability of native trout and suckers to thrive in area lakes. Higher in the watershed, brook trout compete directly with native redband trout.

## Wildlife and Wildlife Habitat

**Management Goal 1—Facilitate the maintenance, restoration, and enhancement of big game (mule deer, elk, pronghorn, and bighorn sheep) populations and habitat on public land. Pursue management in accordance with Oregon Department of Fish and Wildlife (ODFW) big game species management plans in a manner consistent with the principles of multiple use management.**

### *Analysis of Impacts*

#### Alternative A

Protection, restoration, and enhancement of desirable vegetation communities would be beneficial to big game habitat. Management of vegetation within bighorn sheep habitat to provide for diverse, self-sustaining wildlife communities would have positive impacts to bighorn sheep.

Reduction and exclusion of natural (wildland) fires across the landscape has led to a dramatic increase of western juniper in many wildlife habitats. Historically, periodic wildland fires removed invasive juniper and sagebrush, and renewed big game forage grasses and forbs. If invasive western juniper continue to increase, many habitats would be adversely affected. The big game forage base would decrease and predator hiding cover would increase. Though juniper management projects could be implemented in some areas, under current management plans, no specific direction exists for the removal of juniper in bighorn sheep habitat. As western juniper cover increases, bighorn sheep use would be concentrated in areas with less western juniper cover.

Noxious weeds are a significant threat to almost all wildlife habitats. Continued efforts to control noxious weeds would be beneficial to big game. Some limited disturbance for short periods would occur during weed control activities, but over the long term, these activities would be beneficial.

Current forage production on nonnative ranges have both positive and negative impacts to big game species. Some desirable nonnative seedings, like crested wheatgrass, provide habitat for pronghorn and mule deer at some times of the year. Depending on the grazing season and duration of use, these seedings could have both positive and negative impacts to these species. If large seedings overlap with mule deer winter range, negative impacts for deer will occur.

Limiting livestock use on winter browse would benefit mule deer and pronghorn.

The ODFW has set management objectives for most populations of game species that occur within the planning area. Current livestock numbers and forage allocations are not considered to be a limiting factor for most big game species. Some negative impacts occur, but most could be minimized by adjustments in the timing, duration, and location of livestock grazing during critical times of the year when these wildlife species are present.

Current livestock and wild horse management practices would have minimal impacts to bighorn sheep populations and habitat. This is mostly due to differences in habitat use. Overlap does exist between livestock/horses and bighorn sheep, especially during drought conditions when bighorn sheep are more likely to venture farther away from rimrock areas in search of water. Current livestock or wild horse numbers and forage allocations are not considered to be limiting factors on bighorn sheep populations. If this was to change in the future, livestock/wild horse allocations or numbers would be adjusted on a case-by-case basis.

Range improvement projects would have both negative and positive impacts, depending on the location and type of project proposed. Range improvements to increase forage could benefit big game species, but would probably not occur in the steep, rocky areas typical of bighorn sheep habitat and would have minimal impacts on bighorn sheep. Maintenance and improvements in existing wildlife water developments would benefit wildlife. Maintaining a buffer of at least 9 miles between occupied bighorn sheep habitat and domestic sheep and goats would help to ensure that bighorn sheep do not contract diseases from these animals.

Current recreation activities would have minimal effects on big game and their habitat. Recreational viewing and hunting does occur throughout the planning area. Hunting serves as one important management tool for controlling herd populations at levels set by the ODFW. These impacts would continue to be minimal and are not expected to dramatically increase over time.

Adverse impacts from exploration and development of locatable and salable minerals could impact big game habitats. Loss or destruction of habitat could occur through surface-disturbing operations. Leasable mineral development could impact big game habitat, but the impacts could be mitigated more effectively

(Appendix N3). After mine closure and reclamation, these species would reoccupy these areas (provided mining activities did not result in invasions of undesired vegetation or noxious weeds). If the Devils Garden WSA is not designated wilderness, disposal of mineral material, decorative stone, and cinder in the area would negatively impact bighorn sheep habitat.

Impacts from land acquisitions and disposals would be minimized by retaining land with quality bighorn sheep habitat and mule deer winter range. Impacts from authorizations of rights-of-way for large-scale powerlines, fiberoptic cables, and pipelines could be significant, depending on how much habitat was impacted and by using appropriate mitigation and BMP's.

Continuing seasonal road closures in the Cabin Lake/Silver Lake Deer Winter Range Cooperative Closure Area and permanent road closures in the Devils Garden WSA/ACEC and Cougar Mountain (Table 4-4) would reduce harassment of mule deer and bighorn sheep.

### **Alternative B**

Protection, restoration, and enhancement of desirable vegetation communities would be beneficial to big game habitat, provided that forage enhancement activities for livestock did not overlap with mule deer or pronghorn winter range.

Reduction and exclusion of natural fires across the landscape has led to a dramatic increase of western juniper in many habitats. Historically, periodic fires removed invasive juniper and renewed forage. The treatment of 18,000 to 30,000 acres of invasive juniper on bighorn sheep range in the Devils Garden, East Lava Field (Squaw Ridge), Fish Creek Rim (Lynch Rim), South Warner Rim, Coleman Rim, South Abert Rim, and Hadley Butte herd ranges and 10,000 to 25,000 acres in mule deer winter range using a combination of prescribed fire and mechanical methods would benefit big game. After treatment, the forage base would increase and predator hiding cover would decrease, thereby having positive impacts.

Reducing the amount of invasive western juniper in bighorn sheep habitat would occur on Lynch Rim and would have positive impacts to bighorn sheep. Within this area, removal of western juniper would provide the increased forage and better landscape structure that bighorn sheep prefer.

Noxious weeds are a significant threat to almost all wildlife habitats. If efforts are shifted from controlling

weeds in big game habitats to control in other commodity-driven areas, then big game habitats would suffer negative impacts. These impacts would probably be minor, unless major disturbances occurred and the resulting conditions were more suitable for noxious weeds.

By placing an emphasis on specific habitat needs for individual species, including big game species, management of vegetation within big game habitats providing diverse, self-sustaining communities of wildlife would have positive impacts to big game species. Improvements in onsite wildlife water developments in some areas would also have beneficial impacts to wildlife.

Increased emphasis on forage production and increased numbers of livestock could cause increased negative impacts to big game species. Direct competition between big game species and livestock for forage would remain minor due to dietary differences between livestock and most species. Adjustments in timing, duration, and location of livestock grazing would minimize other impacts to big game species. Livestock and wild horse management practices would have minimal impacts to bighorn sheep populations and habitat, mostly due to differences in habitat use. Overlap does exist between livestock, horses, and bighorn sheep, especially during drought conditions when bighorn sheep are more likely to venture further away from rimrock areas in search of water. Current livestock or wild horse numbers are not considered to be limiting factors on bighorn sheep populations. If this changed within the life of the plan, changes in livestock allocations or wild horse numbers would be addressed on a case-by-case basis and adjustments would be made accordingly.

Increased fire response and full suppression in commodity areas would have both positive and negative impacts to big game habitats. Fires would have positive long-term benefits to big game by removal of invasive western juniper. Fires would also have negative, short-term impacts if forage and cover species were removed.

The impacts of recreational viewing and hunting of big game would be similar to Alternative A.

Impacts from energy and mineral exploration and development in big game habitats would be similar to Alternative A. Loss or destruction of habitat could occur in the case of some surface operations. After mine closure and or reclamation, these species would reoccupy these areas, providing the activities do not

result in invasions of undesired vegetation or noxious weeds. Negative impacts to bighorn sheep would result from increased human activity in the areas of the Devils Garden, Squaw Ridge, and Four Craters lava flows. Removal of cinders and decorative stone would cause bighorn sheep displacement and possible abandonment of habitats where repeated disturbance from humans occurs. Increased activity in the north end of Lake Abert ACEC could also cause increased negative impacts compared to Alternative A.

Maintaining existing seasonal/permanent road closure impacts would be similar to Alternative A.

### **Alternative C**

The increased emphasis on restoration and ecosystem health and decreased emphasis on commodity production would provide increased forage for big game species, including areas of nonnative seedings. These positive impacts would occur where the desirable vegetation was compatible with the type of forage that big game prefer.

Invasive western juniper would be actively treated in some areas for wildlife habitat restoration purposes. Reduction and exclusion of natural fires across the landscape has led to a dramatic increase of western juniper in many habitats. Historically, periodic fires removed invasive juniper and renewed forage. The treatment of 18,000 to 30,000 acres of invasive juniper on bighorn sheep range in the Devils Garden, East Lava Field (Squaw Ridge), Fish Creek Rim (Lynch Rim), South Warner Rim, Coleman Rim, South Abert Rim, and Hadley Butte herd ranges and 10,000 to 25,000 acres in mule deer winter range using a combination of prescribed fire and mechanical methods would benefit big game. This would have beneficial impacts to big game species if patches of adequate security cover are left after treatment. After treatment, the forage base would increase and predator hiding cover would decrease, thereby having positive impacts.

Increased control of noxious weeds would have positive benefits to big game. Currently, noxious weeds occur in a few areas. At this time, many of these infestations are minor, but given the right conditions, have potential to increase. Increased weed control would not dramatically increase big game populations but would provide better quality habitat.

Big game habitat would improve as a result of increased watershed function and improved watershed condition.

Allocation of an additional 9,138 AUM's of wildlife forage would benefit big game populations. Direct competition between big game species and livestock for forage would decrease and remain minor due to dietary differences between livestock and most game species. Adjustments in timing, duration, and location of livestock grazing would minimize other impacts to big game species. Limiting livestock use on winter browse would benefit deer and pronghorn. Allowing no domestic sheep grazing in the planning area unless it can be demonstrated that it would not negatively impact established or proposed bighorn sheep augmentation sites would minimize conflicts between bighorn and domestic sheep.

The impacts of recreational viewing and hunting of big game would be similar to Alternative A.

Limiting OHV use to existing roads and trails across the planning area would result in less disturbance to big game. Disturbance from OHV's does occur in some areas and is higher in the early spring and fall. Reduced disturbance from OHV's will result in positive impacts to big game.

Impacts from fire suppression activities would be similar to those in Alternative B. In extreme cases, wildland fire would alter big game habitats enough to have negative impacts. Repeated fire could negatively impact habitat by changing from perennial species to annual exotic grasslands, such as cheatgrass. As a result of fuels reduction projects, potential wildland fire frequency, size, and severity would decline over the life of the plan. This would have positive impacts to many big game habitats.

Impacts from energy and mineral exploration and land acquisitions would be similar to those in Alternative A. Adverse impacts could result from loss or destruction of habitat during some operations, but impacts are expected to be kept to a minimum by avoiding important habitats. Expanding seasonal/permanent road closures would benefit mule deer and bighorn sheep more than Alternative or B (Table 4-4).

Closing roads that are not needed would benefit big game. Road closures would reduce access and thereby, reduce human disturbance, increasing the quality of the habitat.

### **Alternative D**

Protection, restoration, and enhancement of desirable vegetation communities would be beneficial to big game habitat. Increased emphasis on restoration and

habitat diversity in nonnative seedings would have positive impacts to game species. These positive impacts to game species would occur where increased emphasis on desirable vegetation was compatible with forage that game species would utilize.

Invasive western juniper would be treated in some areas for restoration of wildlife habitat. The impacts would be similar to Alternative C.

Noxious weeds are a significant threat to almost all wildlife habitats. Continued efforts to control noxious weeds would be beneficial to big game habitat. Some limited disturbance for short periods would occur in big game habitat during weed control activities, but would be beneficial over the long term.

By placing equal emphasis on habitat needs for individual species, communities, game, and nongame species, management of vegetation within big game habitats to provide for diverse, self-sustaining communities would have positive impacts to big game. Allowing no new domestic sheep grazing in the planning area unless it can be demonstrated that it would not negatively impact established or proposed bighorn sheep augmentation sites would minimize bighorn sheep/domestic sheep conflicts. Improvements in onsite wildlife water developments would also have beneficial impacts to wildlife in some areas.

Current forage production on nonnative ranges would have both positive and negative impacts to big game species. Some desirable nonnative seedings, like crested wheatgrass, provide habitat for pronghorn and mule deer at given times of the year. Depending on grazing season use and duration of use, these seedings could have both positive and negative impacts to these species. If large seedings overlap with deer winter range, negative impacts would occur. Some negative impacts could be minimized by adjustments in the timing, duration, and location of livestock grazing during critical times of the year when these wildlife species are present. Allocation of an additional 9,138 AUM's of wildlife forage would benefit big game populations. Limiting livestock use on winter browse would benefit deer and pronghorn.

Livestock and wild horse management practices have minimal impacts to bighorn sheep populations and habitat, mostly due to differences in habitat use. Overlap does exist between livestock, horses, and bighorn sheep, especially during drought conditions when bighorn sheep are more likely to venture further away from rimrock areas in search of water. Livestock or increased wild horse numbers would not limit

bighorn sheep populations. If this changes within the life of the plan, changes in livestock allocations or wild horse numbers would be addressed on a case-by-case basis and adjustments would be made accordingly.

Range improvements to increase forage would probably not occur in bighorn sheep habitat and would have minimal impacts to bighorn sheep. Range improvement projects in other big game habitats would have both negative and positive impacts, depending on the location and type of project proposed.

Impacts of recreation viewing and hunting would be similar to Alternative A.

Impacts from OHV use would be reduced on the northern one-third of the planning area, due to limiting vehicles to existing or designated roads and trails (Map R-7). This would lead to greater security and habitat quality for big game species within this area.

Adverse impacts from exploration and development of minerals could occur on big game habitats. Loss or destruction of habitat could occur in the case of some surface operations. After mine closure and reclamation, these species could reoccupy these areas, providing that reclamation activities did not result in invasions of undesired vegetation or noxious weeds. If the Devils Garden WSA is not designated as wilderness, disposal of mineral material, building stone, and cinders in that area would negatively impact bighorn sheep habitat.

Impacts from land acquisitions and disposals would be minimized by retaining land with quality bighorn sheep habitat and mule deer winter range. Impacts from authorizations of rights-of-way and permits for large-scale powerlines, fiberoptic cables, and pipelines could be significant if large areas of significant habitat were impacted. It is expected that these impacts would be avoided through the use of right-of-way avoidance and exclusion areas (Map L-8).

Expanding seasonal/permanent road closures (Table 4-4) would benefit mule deer and bighorn sheep more than Alternatives A and B, but less than Alternative C (Map SMA-24).

### Alternative E

No active restoration of big game habitats would occur. Habitat quality and condition would be determined by natural processes.

Impacts from noxious weeds would increase due to

lack of control and increased spread rates after fires. With lack of noxious weed control and no active restoration after wildland fires, quality of big game habitat would decrease over the life of the plan.

No livestock grazing would be authorized across the planning area; therefore, no forage allocation would be necessary. Maximum forage would be available for wildlife uses. No major negative impacts from management of forage production would occur to wildlife. Wildlife populations would be expected to slightly increase over the life of the plan, except that impacts from fire or other natural processes would change the habitat.

Impacts from wild horses would remain the same as Alternative A. Some negative impacts to wildlife would be expected to occur, but these could be kept to a minimum by close monitoring of wild horse numbers within herd management areas and by gathering excess horses on a regular basis.

Wildland fire would be the major factor shaping wildlife habitats on the landscape. In most areas of the sagebrush steppe, there would be no threats to human life or manmade structures, and therefore, wildland fires would not be suppressed. In dry years, large wildland fires would sweep over the landscape changing the structure of most wildlife habitat from sagebrush steppe to grassland. Sagebrush steppe that currently has a viable understory of native and nonnative perennial grasses and forbs would probably continue to have these perennial species after recovery from fire. Sagebrush steppe that currently has an understory of exotic annual grasses or no perennial grasses would most likely be converted to annual grasslands, which would require several years without fire to allow shrub reestablishment. It is doubtful that shrubs could be reestablished on many of these sites without active restoration or rehabilitation. Wildland fires would not receive active rehabilitation.

Positive impacts from fire would occur from western juniper removal in some habitats. Western juniper stands with a significant shrub understory remaining or with closed canopies would be removed by wildland fire. Western juniper stands without a sufficient shrub understory or closed canopies would remain on the landscape.

Impacts of recreation viewing and hunting would be similar to Alternative A.

Use of OHV's would be limited to existing or designated roads and trails across the planning area. This

would provide positive impacts to big game species.

### **Summary of Impacts**

Under Alternative A, big game habitat would continue to improve slowly over time. Continued emphasis on single species management and on game species would ensure that habitats for game species are maintained. Active management of invasive western juniper, winter range, and noxious weeds would be the key to success. These activities would be considered through site-specific analysis on a case-by-case basis for each area and would not be considered for big game habitats as a whole across the planning area. The management goal would be met over the life of the plan.

Impacts for Alternative B would be similar to Alternative A, except that more human disturbance would occur in bighorn sheep habitat from rock collectors. If this disturbance was significant, displacement of bighorn sheep from these habitats would occur. This alternative also takes a more active approach to managing western juniper. If displacement of bighorn sheep occurs under this alternative, the management goal for bighorn sheep would not be met within these areas. The management goal would be met in areas where increased human activity did not take place.

Under Alternatives C and D, habitats for big game species would also be maintained. Emphasis would be placed on communities, game, and nongame species. Both alternatives take a more holistic approach to western juniper management, outlining where management activities would be expected to occur over the life of the plan. Both alternatives focus on active restoration of degraded habitats, but Alternative C would achieve the management goals faster than Alternative D. Neither of these alternatives would be effective without increased funding for restoration. The management goal would be met under both alternatives, but the timeframe would be directly associated with the amount of funds that are available for restoration.

Under Alternative E, wildland fires would not be suppressed except to protect human life and property, and would likely burn more habitats than under the other alternatives. The lack of active restoration would have negative impacts to big game habitat if noxious weeds or exotic annual grasses became major problems. This management goal would likely not be achieved completely under this alternative. The degree of achievement would rely solely on natural processes and could vary greatly.

### ***Secondary, Indirect, and Cumulative Impacts***

Under Alternative E, indirect impacts from natural processes would occur. Wildland fire would remove a large proportion of shrub habitats from the planning area. No active restoration would occur on lands burned by wildland fire. This would have dramatic negative impacts to many big game species. If this happens, many sites with low ecological integrity and invasive annual grasses would develop into annual grasslands, decreasing the value of these lands for wildlife.

Historic cumulative impacts to big game habitat were from overgrazing at the turn of the century and introduction of domestic sheep diseases. Degraded range conditions allowed for invasion by cheatgrass and noxious weeds. Decades of fire suppression have also allowed western juniper invasion in some areas. Without major new disturbances in noxious weed areas, the spread of these weeds would eventually stabilize, but disturbances in this landscape are inevitable. Alternatives that support noxious weed control, removal of western juniper in a natural mosaic pattern, and active restoration of big game habitats would reduce or eliminate these cumulative impacts.

***Management Goal 2—Manage upland habitats, including shrub steppe, forest, and woodlands, so that the forage, water, cover, structure, and security necessary for wildlife are available on public land.***

### ***Analysis of Impacts***

#### ***Impacts Common to All Alternatives***

Following the interim greater sage-grouse management guidelines (Sage-Grouse Planning Team 2000) would protect and enhance greater sage-grouse habitat (sagebrush connectivity and grass/forb availability) until a more comprehensive, long-term strategy for greater sage-grouse and other sagebrush steppe-dependent wildlife species is completed. The degree to which these interim guidelines are implemented does vary somewhat by alternative; most notably between Alternatives C and D. Once completed, the long-term strategy would supercede the greater sage-grouse direction contained in this RMP, to the further benefit of greater sage-grouse and their habitat.

#### ***Alternative A***

Protection, restoration, and enhancement of desirable native upland vegetation communities would be beneficial to upland wildlife species, including sage-

brush-dependent species by increasing the quality of habitat.

Maintaining large nonnative seedlings and not allowing sagebrush to naturally reestablish in these areas would have negative impacts to some wildlife species, especially sagebrush-dependent species. Large seedlings could act as a barrier thereby reducing dispersal and movements from one habitat area to another.

Restoring degraded or decadent shrublands would have a positive impact on sagebrush-dependent wildlife. As active management and restoration of these areas occurs, better-quality habitat would be available for sagebrush-dependent wildlife.

Management of commercial forestlands would only be considered for forest or ecosystem health issues. These types of activities would have beneficial impacts to forest/forest fringe wildlife species.

Juniper woodland management would continue to occur on a limited scale. Reducing the amount of invasive western juniper in some areas where it has invaded sagebrush stands would have positive impacts to upland wildlife, particularly sagebrush-dependent wildlife (Miller 1999; Reinkensmeyer et al. 2000), provided the area is not subsequently invaded by undesirable plant species or noxious weeds. When western juniper begins invading sagebrush, the diversity of wildlife species, mostly small birds and mammals, initially increases. As juniper density continues to increase, the density of shrubs decreases, as does diversity of species using these sites. Eventually, shrubs are outcompeted and disappear from the site, thereby changing wildlife species composition to favor tree and cavity nesters (Miller 1999; Reinkensmeyer et al. 2000). Managing these sites to provide a diversity of habitat would provide positive benefits for a great number of upland wildlife species.

Riparian areas are very important to many upland species because most of them also spend a portion of their time in this habitat. Activities that restore or improve riparian vegetation and function would have positive impacts to upland species. The degree of these impacts would be directly related to the degree of improvement in riparian vegetation and function.

Noxious weeds are a serious threat to all upland wildlife species, but especially to sagebrush-dependent species. When noxious weeds invade high quality wildlife habitat, forage, cover, and structure of habitats are negatively impacted. Efforts to control and eradicate noxious weeds would have positive impacts to

upland wildlife, including sagebrush-dependent wildlife. The degree of these impacts would be directly related to the degree of decrease in noxious weeds and the degree of restoration that occurs after weed eradication.

Negative impacts to migratory upland birds would occur on a case-by-case basis. Fragmentation of habitats would still occur, but would improve slowly over time. Limited restoration projects would have positive impacts to migratory landbirds, but conservation of habitats would not be done on a landscape scale. Habitats for migratory upland birds would be expected to remain the same over time.

Current livestock and wild horse management practices could have some negative impacts to upland wildlife, including sagebrush-dependent species, by direct or indirect alteration of forage, cover, and/or habitat structure. Excessive utilization in some areas would remove desirable grass and forb cover that some species require. These negative impacts could be minimized by adjustments in timing and duration of livestock use and by close monitoring of wild horse herds within the herd management areas.

The habitat protection resulting from management of existing ACEC/RNA's would continue to have positive benefits to upland and sagebrush-dependent wildlife species. Management of these areas has resulted in slight increases in the habitat quality and populations of these species.

Current and historic fire suppression activities have had a dramatic impact on sagebrush-dependent wildlife. This, along with other factors, has contributed to an increase in the density of sagebrush stands and a decrease in the grass and forb component within those stands. This has had a negative impact on many upland species, including sagebrush-dependent species. If current management trends continue without active sagebrush stand restoration, populations of many sagebrush-dependent species would continue to decline. At the landscape level, these dense stands of sagebrush would likely burn more intensively and across larger areas than under historical conditions. As a result, most sagebrush types in the planning area would likely not reestablish for decades.

Prescribed fires can have dramatic positive and negative impacts to wildlife habitat. These impacts depend greatly on the wildlife species being considered and on the intensity, duration, and timing of the fire activity. Impacts from prescribed fire would be considered on a case-by-case basis.

OHV use would continue to impact upland and sagebrush-dependent species throughout much of the planning area. Most negative impacts to these species would be related to direct disturbance and would typically occur during nesting season. Some habitat modification could also take place, but this would be limited to a few areas.

Energy and mineral exploration and development and new rights-of-way or utility corridors would have some negative impacts on upland wildlife habitat within localized areas. New mineral developments in sagebrush habitats could be mitigated by avoiding important areas, limiting surface disturbance, and limiting travel off existing roads. However, most impacts would require a long time to recover and a loss of habitat would result in the short term. New rights-of-way or utility corridors located in native sagebrush habitat would have negative impacts on sagebrush-dependent wildlife. New construction located near greater sage-grouse lek sites would cause habitat disturbance and create raptor perches. This could cause major negative effects and, over time, cause abandonment of the lek site due to increased predation, or habitat changes.

### **Alternative B**

Impacts would be the same as Alternative A, with the following differences:

Restoring degraded and decadent shrublands would have a positive impact on sagebrush-dependent wildlife. However, Alternative B would emphasize restoration that optimizes forage production rather than native wildlife habitat. If an increase in forage allocation occurred on decadent or degraded native rangeland, the resulting decrease in grasses and forbs and increase in sagebrush density would have negative impacts on greater sage-grouse and other sagebrush-dependent wildlife species.

Reducing the amount of invasive western juniper in some areas would have similar impacts as Alternative A, but less emphasis would be placed on nongame wildlife species where increased commodity production could be attained.

Livestock management would be similar to Alternative A, but would have increased negative impacts on wildlife habitat due to the increased emphasis on commodity production.

Impacts from prescribed and wildland fire would be the same as Alternative A. However, increased treatments

of quaking aspen stands with prescribed fire would remove invasive western juniper, stimulate new aspen growth, and would have positive impacts to associated wildlife species.

Increased energy and mineral exploration and development on the north end of Abert Lake would have significant negative impacts to wildlife. If sodium settling ponds were built within the guidelines of the mineral development scenarios (Appendix N2), wildlife would be displaced from 30 to 50 percent of the playa habitat on the north end of the lake. Geothermal energy development would have similar impacts. Supporting facilities, such as a processing plant, powerlines, and pipelines, would also cause increased negative impacts to wildlife through modification of habitat.

### **Alternative C**

Protection, restoration, and enhancement of desirable vegetation communities would be beneficial to upland wildlife species, including sagebrush-dependent species. Increased emphasis on native plant species and on reestablishing species diversity and structure in nonnative seedings would increase both the quality and quantity of habitat available for these species. If significant protection and restoration were to occur across the landscape, then populations of these wildlife species would increase.

Management of large blocks of sagebrush steppe would have positive impacts to migratory landbirds. A focus on existing shrub steppe in high ecological condition and a “no net loss” of these habitats would have positive impacts to these species. Positive impacts would also occur through a reduction in fragmentation from restoration of degraded rangelands and changes in management activities. Habitats for many species of landbirds would be expected to increase over time.

Reducing the amount of invasive western juniper in some areas would have similar impacts as Alternative A, but increased emphasis would be placed on non-game wildlife species. Reducing the amount of young western juniper in areas where it has invaded sagebrush stands would have a positive impact to sagebrush-dependent wildlife (Miller 1999; Reinkensmeyer et al. 2000), provided the area is not subsequently invaded by undesirable plant species or noxious weeds. Managing these sites to provide a diversity of habitats would provide positive impacts for a great number of wildlife species.

Management for zero tolerance for noxious weeds

would benefit most wildlife species. Aggressive noxious weed management would increase habitat quantity and quality for upland and sagebrush-dependent wildlife species.

Increased emphasis on landscape management and ecosystem health and decreased emphasis on commodity use would have positive impacts on wildlife species by increasing the quality of available habitat. Reductions in livestock forage allocations, adjustments in timing and duration of livestock use, and close monitoring of wild horse herds within the herd management areas would minimize negative impacts.

The habitat protection resulting from management of existing and new ACEC/RNA's would have positive benefits to upland and sagebrush-dependent wildlife species. This would result in slight increases in habitat quality and populations of these species.

Wildland fire management activities under this alternative would shift to aggressive fire suppression in sagebrush habitats with high ecological integrity to protect remaining habitats important to sagebrush dependant species. Without aggressive suppression, declines in sagebrush-dependant species would accelerate. The increased emphasis on the use of prescribed fire for restoration of degraded habitats could have negative impacts to sagebrush-dependent wildlife species if key habitats are burned. Treating habitats that are key to the survival of these species would be avoided if significant negative impacts are suspected. Increased treatments of quaking aspen stands with prescribed fire would remove invasive western juniper, stimulate aspen growth, and would have positive impacts to associated wildlife species.

Limiting OHV use to existing roads and trails across the planning area would result in much less disturbance and greater security for upland wildlife species compared to Alternatives A or B. Reduced disturbance from OHV's would result in slight increases to these species.

New rights-of-way or utility corridors, if located in native sagebrush habitat, could have negative impacts on some sagebrush-dependent wildlife. However, the location of new rights-of-way would be avoided in greater sage-grouse habitat (Map L-4 of the Draft RMP/EIS and Map W-1).

Impacts from energy and mineral exploration would be the same as those listed in Alternative A.

### **Alternative D**

Restoring degraded and decadent shrublands would have a positive impact on sagebrush-dependent wildlife. As active management and restoration of these areas occurred, better quality habitat would be made available. Protection, restoration, and enhancement of other desirable upland vegetation communities would benefit wildlife by increasing the quality of habitat. Maintaining large nonnative seedings and not allowing sagebrush to naturally reestablish these areas would have negative impacts to sagebrush-dependent species. Large seedings could act as a barrier to some species, thereby reducing movement from one habitat area to another.

Management of large blocks of sagebrush steppe would have positive impacts to migratory landbirds. A focus on existing shrub steppe in high ecological condition and a “no net loss” of these habitats would have positive impacts to these species. Positive impacts would also occur through a reduction in fragmentation from restoration of degraded rangelands and changes in management activities. Habitats for many species of landbirds would be expected to increase over time.

Riparian areas are very important to many upland wildlife species because most of them also spend a portion of their time in this habitat. Activities that restore or improve riparian vegetation and function would have positive impacts. The degree of these impacts would be directly related to the degree of improvement in riparian vegetation and function.

Management of commercial forestlands would only be considered for forest health or wildlife issues. These types of activities would have beneficial impacts to forest/forest fringe wildlife species.

Reducing the amount of invasive western juniper in some areas where it has invaded sagebrush would have positive impacts to wildlife (Miller 1999; Reinkensmeyer et al. 2000), provided the area is not subsequently invaded by undesirable plant species or noxious weeds. When western juniper begins invading sagebrush, the diversity of wildlife species, mostly small birds and mammals, initially increases. As juniper density continues to increase, the density of shrubs decreases, as does the diversity of wildlife species using these sites. Eventually, shrub cover would disappear from the site, thereby decreasing species diversity (Miller 1999; Reinkensmeyer et al. 2000). Managing these sites to provide a diversity of habitat would provide positive impacts for a great number of wildlife species. Reducing the amount of

invasive western juniper in bighorn sheep habitat would have positive impacts to bighorn sheep. Within these areas, removal of western juniper would provide the increased forage and better landscape structure.

Noxious weeds are a serious threat to all upland wildlife species. When noxious weeds invade quality wildlife habitat, forage, cover, and structure of habitats are negatively impacted. Efforts to control and eradicate noxious weeds would have positive impacts to wildlife. The degree of these impacts would be directly related to the degree of decrease in noxious weeds and the degree of restoration that occurs after weed eradication.

Livestock and wild horse management practices could have some negative impacts to upland wildlife species by altering forage, cover, and/or structure of habitats directly or indirectly. Excessive utilization in some areas can remove desirable grass and forb cover that some species require. These negative impacts can be minimized by adjustments in timing and duration of livestock use and by close monitoring of wild horse herds within the herd management areas for appropriate management levels.

The impacts of existing and new ACEC/RNA management and fire management would be similar to Alternative C.

Current and historic suppression of wildland fires, along with other factors, has contributed to an increase in the density of sagebrush stands and a decrease in the grass and forb component within those stands. This has had a negative impact on many wildlife species. This trend would be countered by increased prescribed fire and wildland fire use. Fire can have dramatic positive and negative impacts to wildlife habitat. These impacts depend greatly on the wildlife species being considered and on the intensity, duration, and timing of the fire activity.

Limiting OHV use to existing roads and trails in the northern end of the planning area (Map R-7; Table 4-5) would decrease impacts to upland wildlife species. Reduced disturbance from OHV's could result in slight population increases of these species.

Energy and mineral exploration and new rights-of-way or utility corridors would have some negative impacts on upland wildlife habitat within localized areas. New mining activities in sagebrush vegetation could be mitigated by avoiding areas, limiting surface disturbance, and limiting travel off existing roads. However, most impacts would require a long time to recover, and

a loss of habitat would result in the short term. New rights-of-way or utility corridors, if located away from existing corridors and in native sagebrush habitat, would have negative impacts on sagebrush-dependent wildlife. The location of new rights-of-ways would be avoided near greater sage-grouse lek sites and breeding habitat (Map L-8 and W-1).

### **Alternative E**

Natural processes would be the driving force shaping the quality, connectivity, and diversity of upland wildlife habitats.

Impacts from noxious weeds would increase due to the lack of control and increased spread rates after wild-fires. With lack of noxious weed control and no active restoration after wildland fires, wildlife habitat quality would decrease.

No livestock grazing would be authorized across the planning area. All existing forage would be available for wildlife use. Increased residual grasses and forbs would benefit sagebrush-dependent wildlife species. Upland wildlife populations could increase, except that impacts from fire or other natural processes would change habitats.

Impacts from wild horses would be similar to Alternative A. Some negative impacts to wildlife would be expected, but these could be kept to a minimum by close monitoring of wild horse herds within the herd management areas and by gathering excess horses on a regular basis.

Wildland fire would be the major factor shaping wildlife habitats on the landscape. In most areas of the sagebrush steppe, there would be no threats to human life or manmade structures and therefore, wildland fires would not be suppressed. In dry years, large wildland fires would sweep over the landscape, changing the structure of most wildlife habitat from sagebrush steppe to grassland. Sagebrush steppe that currently has a viable understory of native and nonnative perennial grasses and forbs would probably continue to have these perennial species present following fire. Sagebrush steppe that currently has an understory of exotic annual grasses or no perennial grasses would most likely be converted to annual grasslands, which would require several years without fire to allow shrub reestablishment. It is doubtful that shrubs could be reestablished on many of these sites without active restoration or rehabilitation. Wildland fires would not receive active rehabilitation.

Wildland fires would open understories in ponderosa pine stands, maintaining them in open conditions. No major negative impacts to wildlife would be expected to occur unless stand replacement fires removed large portions of forest. Western juniper stands with a significant shrub understory remaining or with closed canopies would be removed by wildland fire. Western juniper stands without a sufficient shrub understory or closed canopies would remain on the landscape.

Impacts to upland wildlife from wildland fire would vary widely from species to species.

Wildlife diversity in juniper woodlands would decrease. Areas with the most wildlife diversity (mid-successional stands) would be the ones most likely consumed by wildfire due to the presence of shrubs in these stands. Negative impacts to sagebrush-dependent wildlife would be significant. Without active rehabilitation, many burned habitats would likely be converted to semi-permanent annual grasslands. Available habitat and populations of sagebrush-dependent wildlife would decline over the long term. Increases in nonnative grasses and conversion of sagebrush steppe to grasslands would have negative impacts to migratory landbirds. It is expected that habitats for many species of landbirds would be expected to decrease greatly over time. Other wildlife species that prefer open grasslands would benefit from wildland fire and their populations would be expected to increase.

Use of OHV's would be limited to existing roads and trails across the planning area. Impacts would be similar to Alternative C.

### **Summary of Impacts**

Under Alternative A, habitats for most upland wildlife would remain relatively static over time. Some habitats such as Wyoming big sagebrush will continue to decline, but others, such as open grasslands, would be created. Habitat for sagebrush-dependent species would continue to decline slowly over time. Identification, conservation, and fire suppression activities within the remaining blocks of sagebrush steppe where ecological integrity is still high would offset this decline. Some restoration of degraded sagebrush steppe would occur, but this would not be a priority. Maintaining nonnative seedlings to promote forage production would support the declining trend in sagebrush-dependent species. There would be mixed results for other wildlife species, depending on the species. For the most part, under this alternative, restoration and management of wildlife habitats would only be considered on a case-by-case basis, not at the

landscape level. The management goal would be met over the life of the plan, although no significant increases or decreases would be expected to occur when considering wildlife as a whole.

Impacts from Alternative B would be similar to Alternative A, except that increased emphasis would be placed on commodity production. Restoration would also be focused in commodity production areas. Commodity production areas would receive fire suppression priorities over other resource values. With increased emphasis on commodity production, some wildlife habitats would continue to decline. The management goal for most upland wildlife species would be met within the life of the plan, but at a slower rate than under Alternative A. Sagebrush-dependent species would continue to decline and this management goal would most likely not be met within the life of the plan.

Under Alternative C, remaining habitats that are important to priority wildlife species would be a primary area of focus. The remaining blocks of sagebrush steppe where ecological integrity is high would be closely monitored and conserved. Restoration priorities would be given to those areas with important wildlife habitats, such as sagebrush steppe that is in moderate to low ecological condition where natives grasses and forbs could disappear from the site. Active restoration would move these areas back toward higher ecological integrity and reverse the decreasing trend. Close monitoring of grazing activities to allow for enough residual grasses to remain onsite would also benefit wildlife habitats. Sagebrush-dependent species would increase over the life of the plan at a moderate rate. Alternative C would meet the management goal faster than all other alternatives.

Alternative D would have impacts similar to Alternatives A and C. Habitats that are important to priority wildlife species (sagebrush steppe) would still get priority, but would be achieved at a slower rate than Alternative C and at a faster rate than Alternatives A and B. The management goal would be met under this alternative, but the timeframe for meeting the management goal would be directly associated to the amount of funds that are available for restoration.

Alternative E would impact sagebrush-dependent species the most. Wildland fire would remove a large proportion of the sagebrush habitats over time. No restoration would occur on lands burned by wildland fire. This would have dramatic negative impacts to these species. It would take decades for most of these habitats to recover. Any sites with low ecological

integrity and invasive annual grasses would require much longer to recover. This management goal would not be met under this alternative, and sagebrush-dependent species would decline

Alternative E would negatively impact upland wildlife species the most. Wildland fire would remove a large proportion of sagebrush habitats over time. No restoration would occur on lands burned by wildland fire. This will have dramatic negative impacts to many priority wildlife species. It would take decades for most of these habitats to recover. Any sites with low ecological integrity and invasive annual grasses would require much longer to recover. The management goal will not be met under this alternative and many upland and sagebrush-dependent wildlife species would decline at much greater rates than under Alternative A.

### ***Secondary, Indirect, and Cumulative Impacts***

Historic, cumulative impacts to sagebrush steppe habitats occurred from overgrazing at the turn of the century and decades of fire suppression. Coupled with the invasion of exotic species, such as cheatgrass, this has led to a reduction in understory grasses and forbs and has left much of the remaining sagebrush habitats in moderate to low ecological condition. Activities that allow noxious weeds and invasive exotic plant species like cheatgrass to increase would cause cumulative impacts to wildlife habitats. At any given moment in time, these impacts would not be significant, until some type of large disturbance, like wildland fire, reduces competition with other species, allowing invasive species to increase. Without major investments in restoration, these cumulative impacts would continue to keep most sagebrush habitats in poor condition. Alternatives that support active management and restoration would increase habitat for sagebrush-dependent species.

## **Special Status Animal Species**

**Management Goal—*Manage public land to maintain, restore, or enhance populations and habitats of special status animal species. Priority for the application of management actions would be : (1) Federal endangered species, (2) Federal threatened species, (3) Federal proposed species, (4) Federal candidate species, (5) State listed species, (6) BLM sensitive species, (7) BLM assessment species, and (8) BLM tracking species. Manage in order to conserve or lead to the recovery of threatened or endangered species.***

## *Analysis of Impacts*

### *Alternative A*

Actions that maintain/improve watershed conditions, improve ecological condition, improve vegetation cover and condition, manage nonnative seedings, manage forest and woodland areas, and manage livestock grazing would benefit special status animal species by increasing vegetative cover. Impacts would be minimal because improvement from these actions would be slow and incremental on a variety of sites scattered throughout the planning area. Some special status species could be negatively impacted by an increase in vegetative cover.

Managing sagebrush cover in seedings and on native rangeland to meet the life history requirements of sagebrush-dependent wildlife species could have a positive effect on special status species, utilizing sagebrush habitat by maintaining or improving watershed conditions in the uplands.

Managing for proper functioning riparian/wetland condition only could limit further improvement toward site potential in riparian/wetland special status animal species habitat. Management to promote or maintain proper functioning condition on a minimum of 75 percent of the riparian/wetland areas would limit further improvements toward site potential in special status animal species habitat. Implementation of specific restoration habitat projects in areas where conditions are not recovering naturally would benefit special status animal species. Managing for riparian/wetland conditions that consider structure, forage, and other riparian habitat elements important to game and nongame wildlife species could have positive effects to special status species and their habitat. Riparian/wetland foraging, nesting, and parturition habitat would improve.

Forest management, in the form of commercial and precommercial thinning, partial cut, sanitation and salvage sales, and prescribed burning and wildland fire could have negative impacts to some special status animal species habitat. However, by improving forest health, watershed conditions could be improved, thus having a beneficial effect on special status animal species dependent upon riparian, wetland, or aquatic habitat. All forest health projects would comply with special conservation plans or biological evaluations for potentially affected species.

Juniper management could have positive effects on special status animal species habitat. By improving

ground cover, watershed conditions could be improved, thus having a beneficial effect special status animal species habitat. Juniper removal and prescribed burn projects would have a positive effect on maintaining and enhancing quaking aspen stands with riparian special status animal species. Juniper-dependent special status species could be negatively affected over the short term by stand management.

Control of noxious weeds would improve or maintain watershed conditions, which would result in a positive effect on special status species habitat.

Maintaining or improving watershed conditions would have a beneficial impact on all special status animal species and their habitat. Aquatic species would benefit directly from increased water yield. Increased summer flows would result in better fish survival. Satisfactory soil conditions would result in improved cover, reduced erosion potential, and improved spawning sediments by providing cleaner and better aerated gravels. Maintaining or improving water quality, implementing the CWA, and complying with water quality standards established by ODEQ would have a direct benefit to aquatic special status species. Cooler water temperatures would result in less stress to stream resident fish, thereby improving survival rates, especially for larger fish. Reduced sediment loads would improve spawning gravels.

There have not been any systematic inventories or habitat monitoring of populations and distributions of special status animal species within the planning area, with the exception of the Warner sucker. Impacts to special status species would be minimal. Site-specific environmental analysis and mitigation would be used to minimize or eliminate loss of Warner sucker critical spawning habitat, raptor nesting or roosting sites, or parturition areas. The only current recovery plans for special status species are for bald eagles, peregrine falcons, the Warner sucker, and associated threatened and rare native fishes of the Warner Basin. Implementation of these plans positively affect other special status species.

Existing grazing systems and exclosures on streams, springs, and riparian/wetland areas would continue to improve special status animal species habitat, and the option would be available to further adjust systems and modify or construct new exclosures to meet new special status species objectives. However, current objectives would be defined primarily by proper functioning condition, so the level of improvement would be limited compared to setting objectives based on site potential or individual species habitat require-

ments. Within the range of Warner suckers, the grazing program has been covered by biological evaluations, and where effects may occur, they have been covered by a biological opinion. Effects on other species would need to be covered on a case-by-case basis, accounting for individual species needs.

Authorization of temporary nonrenewable grazing use would preclude excess vegetation providing additional ground cover, litter development, further enhancement of watershed conditions, or nesting cover for ground-nesting special status wildlife species.

Wild horses use the herd management areas year-round and impact these areas negatively (especially the springs in the Beaty Butte area). Confining horses to herd management areas and keeping their populations within appropriate management levels would reduce damage to sites outside these areas. Keeping horses inside the herd management areas could cause negative impacts to special status species within these areas; however, this would indirectly benefit sensitive species occurring outside these areas.

Effects on special status species due to water development project implementation would need to be determined on a case-by-case basis, but generally new developments would concentrate livestock and wild horse use and could have a negative effect on special status species. Fences and other management structures could have a beneficial effect by controlling use away from critical sensitive species use areas or have a negative effect by concentrating use within critical areas. Maintenance of spring developments could have positive effects on terrestrial special status animal species habitat by distributing livestock use away from these areas and providing a semi-permanent water supply to these animals, as well as vegetative habitat. Maintenance of spring developments would continue to restrict riparian site development on several springs and would cause a loss of functioning of the spring system. Potential aquatic special status species, such as spring snails, could be negatively affected by continued maintenance. Limiting playa and lakebed development would maintain the current proper functioning condition of wetland special status species habitat. Some of the current lakebed developments have changed water and vegetative conditions onsite or have broken the water-holding seal, allowing water to travel underground or offsite. This has had a negative effect on special status species, as well as other wildlife populations by reducing the distribution, abundance, and diversity of forbs, an important food source found on the lakebed.

Implementation and maintenance of the Warner Wetlands and Abert Lake ACEC plans (USDI-BLM 1989c, 1996d) would maintain or enhance the current level of proper functioning condition in these two areas and allow the few areas not currently in proper functioning condition to approach this condition. This would maintain or enhance riparian/wetland special status species habitat. Protection of existing ACEC's with special status species habitat values would have beneficial impacts. Retaining existing WSA's could have a positive effect on protecting special status species and their habitat; however, the "Interim Management Policy for Lands Under Wilderness Review" (USDI-BLM 1995b) could preclude some management actions, such as vegetation manipulation or structural project work, that would be beneficial.

Managing public lands to provide social and economic benefits (such as commodity production) to local residents, businesses, visitors, and future generations could have potential future impacts to special status species and their habitat and would need to be determined on a case-by-case basis.

The long-term effects of wildland fires could be positive or negative on special status animal species habitat. If the fire results in increased perennial ground cover and better watershed conditions, it would have positive effects. If the fire results in more annual or reduced ground cover, it would have negative effects. All wildland fires would have a negative short-term impact on special status animal species habitat as a result of the removal of vegetation cover. Short-term effects within special status animal species habitat that are in proper functioning condition would be less adverse and functionally would respond quicker to revegetation and rehabilitation efforts. Special stipulations in the "Bald Eagle Management Area Plan" (USDA-FS 1994) focus on protection of bald eagle habitat through wildland fire suppression and prescribed burning projects to reduce fuel loading and the risk of catastrophic stand-replacement fires.

Ground-disturbing wildland fire control activities, including line construction, aerial retardant application, and engine access, could have negative impacts to special status species habitat. Effects would need to be determined on a case-by-case basis and mitigated, where possible, through the fire management planning process.

Rehabilitating burned areas to mitigate the adverse effects of wildland fire on soil and vegetation, and to minimize the invasion of weeds, would have a positive effect on special status animal species habitat. How-

ever, benefits would be limited, since emergency fire rehabilitation activities are implemented on a case-by-case basis.

Prescribed fire could be an effective tool at increasing ground cover and releasing quaking aspen stands from competition with invasive species and would be beneficial to special status animal species. At the current level of prescribed fire activity, impacts to special status species would be minimal and short term. This level, however, may be inadequate to meet the upland vegetation requirements to return to a natural fire cycle. Some sites would continue to decline in ground cover with or without prescribed fire and could require revegetation.

Current management of the Warner Wetlands Special Recreation Management Area and the remaining public land as an extensive recreation management area could cause negative impacts to special status species and their habitat. Effects would occur on a site-specific basis. Increased public use could have a negative effect, while controlling public use could have a positive effect. Current recreation developments are minimal and would have minimal impacts to special status species. Expansion of existing or development of new recreation sites could have a negative effect on special status species habitat. Project design or avoidance could minimize or eliminate impacts.

Continuing the Cabin Lake/Silver Lake Deer Winter Range Cooperative Seasonal Vehicle Closure could have a positive effect on special status species habitat by limiting off-road travel during a period when soils are saturated and the potential for erosion is greatest. Managing motorized vehicles in most of the planning area in the open OHV designation (Map R-2 of the Draft RMP/EIS) would continue to cause negative effects on special status species and their habitat on a site-specific basis, since OHV's could travel cross-country, off existing roads in open areas.

Managing public land actions and activities in a manner consistent with VRM class objectives could minimally impact special status species/habitat by limiting restoration opportunities.

The impacts of energy and mineral exploration and development on special status species and their habitat could vary from minimal with small-scale effects, to major if the activity requires road development and disturbance in special status animal species habitats. Although all practical measures to maintain or restore special status species habitat would be required of all mining operations, impacts to these resources would

continue to occur in the form of localized surface disturbance over the short term. The effects would be similar for oil and gas leasing, geothermal energy, and solid mineral material sales. Laws, regulations, policies, and special stipulations (Appendix N3) would minimize these negative effects.

Land tenure adjustments would have the potential to result in a wide range of positive and negative impacts to special status species and their habitat. Special status species habitat is considered to be of high public value and would be of high priority for retention and acquisition. Riparian/wetland acquisition would benefit riparian/wetland-dependent sensitive species. Once under public ownership, special status species habitat would generally receive higher priority for enhancement, resulting in better vegetation conditions. Law prohibits disposal of special status species habitat that may jeopardize the existence of or lead to actions to further list the species, so impacts from disposal actions would be minimal.

Right-of-way development around or through special status animal species habitat could have a negative impact on the functioning of these sites. Level of mitigation or avoidance would determine the level of effect. Most negative impacts would have limited or temporary impacts to the immediate vegetation. Rehabilitation following surface disturbance should restore this habitat to its functional state before disturbance. Acquiring access could cause minimal effects to special status species and their habitat; however, it could cause negative impacts due to increased visitation and disturbance during critical nesting and birthing periods.

New road construction would have potential for impacting watershed health and therefore, could have a negative impact on special status species and their habitat. The level of effect could be minimized by following road construction and rehabilitation standards. Road maintenance in special status animal species habitat could have a negative impact to the species, which could be mitigated by design modification or relocating the road out of the area.

### **Alternative B**

Maintenance and improvement of watershed and associated ecological condition, soil condition, water quality, vegetative cover and condition, nonnative seedlings, forest and woodland areas, riparian/wetland areas (proper functioning condition), spring developments, and visual resources would have the same impacts as Alternative A.

Implementation of riparian/wetland restoration projects would benefit riparian/wetland vegetation and special status species and their habitat. Modification of spring developments to allow improved riparian function would benefit special status animal species and habitat. Limiting playa and lakebed development would have the same effects as Alternative A. Mitigative measures on BLM-authorized projects would eliminate or reduce impacts to special status species utilizing riparian/wetland habitats.

Juniper management would have more positive and negative effects on special status species and their habitat than Alternative A, since up to 75 percent of early- to mid-successional stands of juniper would be treated. The negative effects of this aggressive juniper management would probably be short term and could be mitigated.

Quaking aspen stand management direction would greatly improve stand condition and maintain those stands that are currently functioning. There could be minimal, short-term impacts to riparian-dependent special status and other species; however, the long-term benefits of stand health would outweigh the short-term impacts. Quaking aspen management would be designed to protect known sensitive species nesting and parturition sites.

Managing upland habitats so that the forage, water, cover, structure, and security necessary for most wildlife are available on public land would benefit some special status animal species.

Continued adjustment of livestock management in those riparian/wetland habitats used by special status species would be beneficial (limited by the goals and objectives of the management action and associated biological evaluation or conservation plan). Increasing domestic livestock grazing authorization by 11,657 AUM's could impact special status species and their habitat, depending on where the increased use would occur. Reinstatement of suspended nonuse and increases to full licensed preference in areas currently below active preference could directly impact special status animal species. Maximizing authorization of temporary nonrenewable grazing use could further preclude opportunities to sensitive animal special habitat, as described in Alternative A.

Wild horse management impacts would be similar to Alternative A but could cumulatively impact special status species and their habitat more if the increase of domestic livestock grazing authorization use (described above) occurs in the same area as wild horse use.

Social and economic uses would be similar to Alternative A; however, impacts to sensitive species could be intensified with emphasis on commodity production and public uses.

The impacts of wildland fire and rehabilitation would be similar to Alternative A. Prescribed fire impacts could increase with the threefold increase of prescribed fire activity proposed, thereby impacting special status species and their habitat even more.

Impacts from optimizing the management of the Warner Wetlands Special Recreation Management Area, designating the North Lake Special Recreation Management Area, and expanding management of existing developed and undeveloped recreation sites would be greater than Alternative A due to increased visitor use.

OHV impacts would be similar to Alternative A; however, maximizing opportunities for organized OHV events could cause more negative impacts to special status species and their habitat than Alternative A.

The effects from the energy and mineral program would be greatest under this alternative due to the emphasis on commodity production. Although all practical measures to maintain or restore special status species habitat would be required of all mining operations, short-term impacts to these resources would continue to occur in the form of localized surface disturbance.

Land tenure adjustments, right-of-way development, and acquisition of public access would have the same impacts as Alternative A.

New road construction would have the greatest potential for impacting watershed health compared to the other alternatives and therefore, would have a negative impact on special status species and their habitat. The level of effect could be minimized by following road construction and rehabilitation standards (Appendix B).

Road maintenance impacts would be similar to Alternative A. However, it is anticipated that more road maintenance affecting sensitive species and their habitat would be completed under this alternative than any other alternative.

### Alternative C

Maintenance or improvement of watershed and associated soil conditions, water quality, riparian/wetland areas (proper functioning condition), special status

plant species management, SMA management, and wild horse management would benefit special status animal species.

Managing sagebrush cover in seedings and on native rangeland to meet the life history requirements of sagebrush-dependent wildlife species would benefit special status animal species. Restoration of nonnative seedings to diversify structure and composition would have beneficial impacts on shrub-dependent special status species and their habitat.

Exclusion of livestock in riparian/wetland habitats would be beneficial to special status animal species using these habitats. Rehabilitation of spring developments would have positive effects on special status animal species by returning all flow to the original channel as long as livestock were excluded from these areas. Eliminating new playa and lakebed development and rehabilitating non-functioning sites would benefit special status species and their habitats and return the sites to proper functioning condition. Mitigative measures on BLM-authorized projects would eliminate or reduce impacts to special status species utilizing riparian/wetland habitats.

Western juniper, old growth, and snag management would have the same impacts to special status species as Alternative B.

Quaking aspen stand management would have the same effects on special status species and their habitat as Alternative B.

Noxious weed management would have the greatest beneficial impacts to special status species and their habitats by eradication of all weeds within the planning area.

Managing upland habitats so that the forage, water, cover, structure, and security necessary for game and nongame wildlife species would positively benefit special status animal species. Bighorn sheep management would have the same effects on special status species as Alternative B. Managing forage production to support the increase of 9,138 additional wildlife AUM's identified by ODFW would have a minimal impact on special status wildlife species and their habitat; however, this alternative would highlight the need to consider the importance of all wildlife species. There would be the potential for future impacts from expansion of the Lake County elk herd, but this would be on a site-specific basis.

Grazing use authorization would be reduced to 86,587

AUM's while emphasizing other resource values. Reducing domestic livestock grazing authorization could benefit special status species and their habitat, depending on where the decreases occurs. Livestock grazing impacts would be less than Alternative A. Eliminating authorization of temporary nonrenewable grazing use and abandonment and rehabilitation of rangeland projects could also benefit special status species if adequate water is available for use.

The impacts of social and economic uses would be less than Alternative A.

Impacts from wildland fires could be greater under this alternative than Alternative A. Reduced livestock grazing would increase the buildup of fine fuels and possibly lead to higher fire frequencies and the loss of more acres of sagebrush, which could have a negative impact on sagebrush-dependent special status species over the short term. With the increased limit of 640,000 acres burned annually and the possible designation of areas for wildland fire use, there is potential for the loss of more special status species habitat depending on where the fires occur. Prescribed fires could be designed to mitigate or eliminate losses, and crucial habitat could be identified prior to the designation of new wildland fire use areas. Most special status species habitat loss would occur naturally from wildland fire and would be short term.

Impacts to special status animal species from dust and smoke created from construction or prescribed burn projects would be the same as Alternative A, even though the acre limit for prescribed fires and wildland fires would increase. Improving ecological conditions and restoration in the uplands after a prescribed or wildland fire would have the same beneficial impacts as Alternative A by maximizing vegetative production and protecting upland function, thereby contributing to the continued health of special status animal species habitat. Minimum standards for ecosystem health would be followed, and rehabilitation seed mixes would be limited to native species only.

Managing the Warner Wetlands Special Recreation Management Area and emphasizing undeveloped, dispersed recreation opportunities in the North Lake Special Recreation Management Area would benefit special status species and their habitat.

Managing off-road vehicles by limiting OHV use to existing or designated roads and trails would benefit special status species and their habitat.

Managing public land actions and activities in a

manner consistent with VRM class objectives would have the same impacts as Alternative A.

The effects from the energy and mineral program would be less than Alternatives A, B, or D, since it emphasizes protection of natural values and restricts mineral development.

Land tenure adjustments, rights-of-way development, and acquisition of public access would have the same impacts as Alternative A. Impacts from disposal of public land would be less than Alternatives A or B, since substantially fewer acres would be available for disposal.

New road construction would have less potential for impacting watershed health and therefore, would have minimal impacts. The level of effect could be minimized by following road construction and rehabilitation standards (Appendix B). The removal of all roads within riparian/wetland areas and all other roads within the planning area not required by law would positively impact special status species and reduce the need to perform future maintenance.

#### **Alternative D**

Maintenance or improvement of watershed and associated soil conditions, water quality, riparian/wetland areas (proper functioning condition), special status plant species management, SMA management, and wild horse management would benefit special status animal species.

Managing sagebrush cover in seedings and on native rangeland to meet the life history requirements of sagebrush-dependent wildlife species would benefit special status animal species. Restoration of nonnative seedings to diversify structure and composition would have beneficial impacts on shrub-dependent special status species and their habitat.

Implementation of riparian/wetland restoration projects would benefit special status species and their habitat. Modification of spring developments to allow improved riparian function would benefit special status animal species and their habitat. Eliminating new playa and lakebed development and rehabilitating nonfunctioning sites would benefit special status species and their habitat and would return the sites to proper functioning condition. Mitigative measures on BLM-authorized projects would eliminate or reduce impacts to special status species utilizing riparian/wetland habitats.

Juniper management would have more positive and negative effects than Alternative A, since up to 50 percent of early- to mid-successional stands of juniper would be treated. The negative effects of this aggressive juniper management would probably be short term and could be mitigated.

Quaking aspen stand management direction would greatly improve quaking aspen stand condition and maintain those stands that are currently functioning. There could be minimal short-term impacts to riparian-dependent special status species; however, the long-term benefits of stand health would outweigh the short-term impacts. Quaking aspen management would be designed to protect known sensitive species nesting and parturition sites.

Noxious weed management would benefit special status species and their habitats by increasing emphasis on habitat restoration.

Maintenance and restoration of fish and aquatic habitat would benefit special status aquatic animal species and their habitat.

Managing upland habitats so that the forage, water, cover, structure, and security necessary for game and nongame wildlife species would positively benefit special status animal species. Managing forage production to support an increase of about 9,138 additional wildlife AUM's identified by ODFW would have a minimal impact on special status wildlife species and their habitat; however, this alternative would highlight the need to consider the importance of all wildlife species. There would be a potential for future impacts from the expansion of the Lake County elk herd, but this would be site-specific.

Continuing the current livestock grazing authorization of 108,234 AUM's would have minimal negative impacts on special status species and their habitat, as long as minimum standards for ecosystem health were met. Temporary nonrenewable grazing use and construction of rangeland projects would not be authorized if there were negative impacts to special status species.

Deferment of livestock grazing for a minimum of two growing seasons after wildland fire or prescribed fire would have positive effects. Implementation and maintenance of livestock grazing systems in riparian/wetland habitats would be beneficial to special status animal species using these habitats by promoting the recovery or maintenance of riparian systems to desired range of conditions based on site potential.

Managing public lands to provide social and economic benefits (such as commodity production) to local residents, businesses, visitors, and future generations could have potential future impacts to special status species and their habitat, and would need to be determined on a case-by-case basis.

Potential impacts from suppression of wildland fires could be greater under this alternative than Alternative A. With the increased limit of up to 480,000 acres burned annually with prescribed and wildland fire and the possible designation of areas for wildland fire use, there would be a potential for loss of more special status species habitat, depending on where the fires occur. Prescribed fires could be designed to mitigate losses, and crucial habitat could be identified prior to the designation of new wildland fire use areas. Most habitat loss would occur naturally from wildland fire and would be a short-term impact. Emergency fire rehabilitation would continue to occur to meet resource objectives. Improving ecological conditions and restoration in the uplands after a prescribed or wildland fire would benefit special status animal species habitat by maximizing vegetative production and protecting upland function, thereby contributing to the continued health of special status animal species habitat. Minimum standards for ecosystem health would be followed; however, nonnative perennial species could be used for fire rehabilitation.

Current recreation developments are minimal and have minimal impact to special status species. Optimizing the management of the Warner Wetlands Special Recreation Management Area and North Lake Special Recreation Management Area would benefit special status species and their habitat.

Enlarging the Cabin Lake/Silver Lake Deer Winter Range Cooperative Seasonal Vehicle Closure would benefit special status species and their habitat by limiting off-road travel during a period when soils are saturated and the potential for erosion is greatest. Managing motorized vehicles with an emphasis on the limited OHV use designation in the northern portion of the planning area (Map R-7) and authorizing organized OHV events on existing roads and trails would minimally impact special status species and their habitat. Off-road vehicle use would still occur in open OHV use designations and would cause negative effects on a site-specific basis.

Managing public land actions and activities in a manner consistent with VRM class objectives could minimally impact special status species and their habitat by limiting restoration opportunities.

Effects of energy and mineral exploration and development could vary from minimal with small-scale effects, to major if the activity requires road development and disturbance in critical special status species habitats. Although all practical measures to maintain or restore special status species habitat are required of all mining operations (Appendix N3), impacts to these resources would continue to occur in the form of localized surface disturbance over the short term. The effects would be similar for oil and gas leasing, geothermal energy, and solid mineral material sales. Laws, regulations, policies, and special stipulations (Appendix N3) would minimize the negative effects from mineral activity.

Land tenure adjustments would have the potential to result in a wide range of positive and negative impacts. Special status species habitat would be considered of high public value and would be a priority for future acquisition. Once under public ownership, special status species habitat would receive generally higher priority for enhancement, resulting in better vegetation conditions. Law prohibits disposal of special status species habitat that could jeopardize the existence of or lead to actions to further list the species, so impacts from disposal actions would be minimal.

Right-of-way development around or through special status animal species habitat could have a negative impact on the functioning of these sites. The level of mitigation or avoidance would determine the level of effect. Most negative impacts would have limited or temporary impacts to the immediate vegetation. Rehabilitation following surface disturbance should restore this habitat to its functional state before disturbance. Acquiring access could cause minimal effects to special status species and their habitat; however, it could cause negative impacts due to increased visitation and disturbance during critical nesting and birthing periods.

New road construction would have less potential for impacting watershed health under this alternative and therefore, would have minimal impacts. The level of effect could be minimized by following road construction and rehabilitation standards (Appendix B). The removal of any roads within riparian conservation areas would positively impact special status species and would reduce the need to perform future maintenance.

### **Alternative E**

Natural processes would be allowed to define vegetation composition in existing vegetation communities. Nonnative seedings and site rehabilitation would not be

conducted under this alternative. The lack of diversity, structure, and composition would have negative impacts on shrub-dependent special status species and their habitat.

Spring developments would be removed as needed for wildlife or wild horses. Springs could be maintained or rehabilitated if critical to special status animal species. Overall, the impacts to special status species would be minimal from spring restoration. Restoration of playa and lakebed habitats would not occur, negatively affecting nonfunctioning riparian/wetland areas used by special status species.

There could be some negative effects to forest-dependent special status species without active forest management, especially forest health projects. Habitats could be lost from fir and juniper encroachment or become unusable to certain special status species. Natural processes would regulate western juniper, old growth, and snags. Juniper expansion would continue causing negative impacts to special status species and their habitat. Natural processes would also regulate quaking aspen stands. Juniper would replace aspen stands and negatively affect aspen-dependent special status species.

Special status plant species would not be managed under this alternative except for Federally listed species, as specified in recovery plans. This action would have a minimal effect on special status animal species.

Noxious weed management would focus only on high priority areas to protect adjacent private property and could have negative impacts on special status species habitats currently infested or occupied in the future.

Maintenance and restoration would not occur in fish and aquatic habitat and could cause negative impacts to riparian, wetland, or aquatic special status species.

There would be no active management of upland habitats to provide forage, water, cover, structure, and security necessary for game and nongame wildlife species, which could cause negative effects on special status species due to concentrated wildlife use. Big-horn sheep would be allowed to disburse naturally and could cause negative effects on other special status species if concentration occurs.

There would be minimal effects on special status species from grazing management. Species dependent upon grazing or some other form of disturbance could be negatively impacted. The lack of grazing would

allow the buildup of fine fuels and increase the risk of large catastrophic wildland fires, which would have a negative impact over the short term. The abandonment of all rangeland projects could negatively impact special status species by concentrating wildlife use or eliminating available water. Mitigative measures would be used on all BLM-authorized projects to eliminate or reduce impacts to special status species habitat; however, projects would be limited to only those required by law and wild horse survival.

Wild horses could cause negative impacts if horse concentration occurs in special status animal habitat.

Full implementation and maintenance of the Warner Wetlands and Abert Lake ACEC plans would not occur and would cause negative impacts to riparian/wetland-dependent special status species from erosion and flooding. SMA designation would not continue and could cause negative impacts to special status species.

Social and economic uses would cause the least impact to special status species, since no commodity production would be allowed from public land.

The impacts from wildland fire would have the greatest negative impact on special status species and their habitat under this alternative. The appropriate management response would emphasize initial attack, full suppression only to protect human life or property. Large tracts of special status species habitat could burn and become unusable for the life of this plan. No emergency fire rehabilitation would be completed following a wildland fire. Natural processes would define future conditions of special status species habitat across the landscape. No restoration would be conducted.

Limiting vehicle use within the entire planning area to existing roads and trails and not authorizing organized OHV events would have a positive impact on special status species.

Managing public land actions and activities in a manner consistent with VRM class objectives would have the same impacts on special status species as Alternative A.

The effects from the energy and mineral program would be least under this alternative.

No riparian or wetland acquisition or disposal would occur and would negatively effect the potential for an increase of riparian/wetland-dependent special status species habitat in public ownership.

New road construction would have the least potential for impacting special status species habitat under this alternative. Only roads required by law would be constructed. The level of effect could be minimized further by following road construction and rehabilitation standards, BMP's (Appendix B), and recovery/conservation plans. Minimal road maintenance would occur under this alternative. Those roads negatively affecting special status species habitat would continue to cause impacts, and other roads within the area would have the potential for causing negative effects in the future without regular maintenance.

### **Summary of Impacts**

Under Alternative A, special status animal species habitat would continue to improve, although recovery rates and extent of recovery would be reduced to allow for commodity uses, including livestock, transportation, and recreation. Management actions would continue on a case-by-case basis with less consideration for watershed-scale effects. The major impacts to special status species would be from wildland fire (short-term impact) and the lack of an aggressive juniper/quaking aspen and weed management program (long-term impact). The management goal for special status species and their habitat could be achieved under this alternative, with the exception of quaking aspen management and the continuing encroachment of juniper into these stands. Without immediate treatment, some quaking aspen stands could be lost forever, negatively affecting quaking aspen-dependent special status species. Wetland areas could also be taken over with noxious weeds if more effective chemicals are not developed and approved. This could have a serious effect on wetland-dependent special status wildlife species.

Impacts from Alternative B would be similar to Alternative A. Because of current law and policy ("Endangered Species Act," CWA, etc.) setting minimum management standards, the difference in effects is not that great, despite the emphasis on commodity production. Minimally-acceptable conditions would be required, and mitigation would occur on a case-by-case basis rather than on a watershed scale. While improvements would occur, they would take longer and not be as extensive as would occur under Alternative A. The management goal for special status wildlife species could be achieved, although at a much slower rate (longer than the life of this plan), due to the emphasis on commodity production and public uses. Juniper and quaking aspen management would be more aggressive than Alternative A and would have a beneficial impact on those species dependent on quaking aspen and

potential negative impacts to species dependent on juniper habitats. Quaking aspen and juniper projects would be designed to minimize or eliminate impacts to special status wildlife species. Noxious weed management would emphasize protection of commodity resources, as opposed to watershed resources, and could have a negative effect on special status wildlife species and their habitat.

Impacts from Alternative C would be much less than under Alternatives A or B. Recovery rates would be much faster, resulting in better special status wildlife species habitat conditions. Considering watershed-scale effects would result in more stable conditions. With emphasis on protection and restoration of natural values, the management goal for special status wildlife species could be achieved under this alternative. This alternative has the most aggressive weed, juniper, and quaking aspen management strategies of any of the alternatives. Alternative C also has the most aggressive prescribed burning and wildland fire use management program, which could cause greater short-term impacts to special status wildlife species and their habitat. With an aggressive emergency fire rehabilitation program, the long-term impacts from prescribed and wildland fire activities could restore marginal special status species habitat.

Impacts from Alternative D would be similar to Alternative C; however, recovery rates for special status wildlife species habitat would require more time. Slower recovery rates would be caused by less stringent direction to restore watershed function and processes, so there would be less improvement to specific special status wildlife species habitat. More consideration would be given to watershed-scale effects than under Alternatives A and B. The management goal for special status wildlife species and their habitat could be achieved under this alternative.

Impacts from Alternative E would be similar to Alternative D; however, without disturbance from permitted activities and active restoration, marginal special status wildlife species habitats may never reach their full potential and currently occupied habitats could become unusable. Watershed-scale effects would progress toward natural recovery of uplands, but increased juniper encroachment would continue to degrade riparian/wetland habitat. By allowing natural processes to determine the outcome of habitat conditions for special status wildlife species, the management goal for special status wildlife species and their associated habitat may never be achieved under this alternative.

### ***Secondary, Indirect, and Cumulative Impacts***

The major secondary, indirect, or cumulative impacts to special status wildlife species would be habitat loss, destruction, conversion to less marginal habitat, and loss of connectivity. The impacts from activities implemented on adjacent USFS- and USFWS-administered lands, as well as private and state lands, would create cumulative impacts to those associated directly with BLM-authorized actions.

For instance, Hart Mountain National Antelope Refuge utilizes prescribed burning and juniper cutting to meet the management objectives in their comprehensive management plan. Private landowners and the USFS are also treating juniper and sagebrush habitats, although at a reduced amount. The cumulative effects of treating juniper and sagebrush habitats, in combination with the BLM's proposed alternatives, could have major impacts to special status species utilizing these habitats. Future treatments would have to be closely coordinated with other Federal and state agencies, and with private landowners to provide optimal habitat and connectivity for sensitive wildlife species. Coordination would also be required with other Federal and state agencies in fire planning to highlight and protect crucial sensitive wildlife species habitats and corridors. All future BLM-authorized juniper and sagebrush manipulation projects would be designed to minimize or eliminate impacts to special status wildlife species and consider the cumulative impacts from other non-BLM projects that may affect special status wildlife species and their habitat.

Timber management on adjacent national forests would have minimal cumulative effect on special status species if the "Bald Eagle Management Area Plan" (USDA-FS 1994) is followed.

## **Livestock Grazing Management**

**Management Goal—*Provide for a sustainable level of livestock grazing consistent with other resource objectives and public land-use allocations.***

### ***Assumptions***

Livestock grazing has an impact on the vigor and reproduction of key plant species. Actions which enhance plant species vigor and reproduction cause an increase in the number and size of that species in a plant community. Conversely, if the action adversely

affects a plant's vigor and reproduction, the species would decrease in number and size in a plant community. Any change in the size or number of a species would be known as a change in composition. For the purpose of this analysis, it is assumed that all available nutrients and water are fully utilized by the existing vegetation. Therefore, any change in the amount of one species would result in an opposite change in the amount of some other herbaceous species. Significant changes in species composition reflect changes in other vegetative characteristics, such as production, range condition and trend, ground cover, and threatened or endangered plants.

The three components of livestock grazing that impact vegetation are vegetation allocation, grazing systems, and range improvements. The vegetation allocation for each allotment was initially determined in the "Range-land Program Summary Record of Decision, Lakeview EIS Area" and associated land use plans (USDI-BLM 1982b, 1983a, 1983b, 1983c) using 50 percent utilization as the standard, except in the crested wheatgrass seedings. The vegetation allocation for each allotment can be adjusted based on subsequent monitoring, allotment evaluation, plan amendments (USDI-BLM 1989c, 1996d; USDI-USFWS and USDI-BLM 1998a, 1998b), allotment management plans, and rangeland health assessments. The vegetation allocation is set so the impacts from utilization are similar across allotments. However, the time and duration of the utilization, which is determined by the grazing system and the range improvements, have a significant impact on the vegetation in each allotment.

Table 4-1 shows how key species composition would be impacted by each grazing system under each alternative. The key species composition is also an indicator of plant cover, plant production, plant vigor, reproduction, and litter cover. The grazing systems are described in detail in Appendix E2 of the Draft RMP/EIS, which also contains a detailed description of grazing impacts on vegetation communities.

### ***Analysis of Impacts***

#### **Alternative A**

Existing management of plant communities would likely maintain or increase the quality and quantity of forage available to livestock. Rehabilitated areas would be excluded from grazing for a minimum of two growing seasons after the project. This forage loss would be short term. Rehabilitation projects would likely increase the quantity and quality of forage available in the long term. Changes in grazing systems

and seasons of use could be used to promote or maintain upland and riparian proper functioning condition.

Current noxious weed management would maintain forage production in some areas, would have the potential to increase forage production in other areas, and may not be effective in some areas, resulting in a loss of forage production.

Special status plant species management could result in changes in grazing systems to protect plant sites or minor decreases in livestock forage due to construction of protective enclosures.

Most management actions for wildlife, wildlife habitat, and special status animal species would have little impact to the current livestock grazing program. The potential for changes in grazing systems and seasons of use would remain. However, most necessary changes to livestock management have already been implemented and no major future actions would be anticipated.

Maintenance and improvement of watershed function and the continuation of existing grazing systems and enclosures would have several impacts to livestock grazing. Providing widely-distributed water sources for livestock would have the potential for long-lasting, negative impacts near the water source, but would have the positive effect of distributing livestock more evenly across the landscape. Forage in existing enclosures would remain unavailable to livestock and decrease livestock distribution somewhat. This would result in slight forage quantity and quality decreases. Impacts from the management of fish and aquatic habitat (primarily related to enclosures) would be similar to those stated above.

The current permitted use level of 164,128 AUM's could be authorized annually. However, it is more likely that the average authorized use level (108,234 AUM's) of permitted use would continue. The full permitted use level for each allotment would continue to be evaluated by allotment through rangeland health assessments, allotment evaluations, allotment management plans, watershed analyses, plan amendments, and implementation of biological opinions. Changes in forage allocation would be made, where needed, on an allotment-specific basis.

Based on existing land use plans, there would be the potential to construct an additional 62 miles of pipeline, 37 reservoirs, and 32 waterholes. Approximately 10,000 acres that were proposed to be treated and seeded have not been completed to date. If imple-

mented, these rangeland improvement projects, in addition to temporary nonrenewable grazing use, would make additional forage available to livestock.

Management of wild horses would reduce the amount of forage and water available for livestock.

The management of existing ACEC's, WSA's, WSR-eligible streams, and significant caves would cause a loss of available forage through changes in grazing systems and seasons to protect other resource values. Most major changes to livestock grazing management have already been implemented.

The use of prescribed fire and rehabilitation of wild-land fires could result in a long-term increase in forage quality and quantity after these sites recover. Fire would cause a decrease in forage available for livestock use in the short term, requiring changes in livestock grazing use. Short-term impacts of emergency fire rehabilitation include grazing exclusion following the rehabilitation.

At the current level of recreational use, there would be no impact to livestock grazing. Areas designated open to OHV use would have the potential to decrease forage availability. There would be a potential for a loss in animal condition if OHV use occurred in the vicinity of livestock and caused stress to the animals.

Mineral exploration and development could impact forage production in localized areas. The extent of these impacts would likely be minimal but would depend on the location and size of disturbance, along with the success of site reclamation following mining activity.

Historically, land exchanges and acquisitions have not had an impact on the forage available to livestock. However, any future acquisition or exchange of lands would have the potential to increase or decrease the forage available to livestock. Approximately 42,500 acres of land would be made available for disposal (Zone 3 shown on Map L-1 of the Draft RMP/EIS). These lands include seven allotments and make up a substantial part of six allotments. Two of these six allotments would have the potential of being completely disposed, resulting in a loss of availability of about 1,485 AUM's of forage. Land acquisition could include lands that would have forage available for livestock. This would have the potential to increase forage available for livestock grazing by an unknown amount.

### **Alternative B**

Management of plant communities would likely increase the available forage to livestock. Forage production would be increased through restoration of existing nonnative seedlings and decadent, disturbed, and degraded sites. Allowing grazing in rehabilitated areas prior to two growing seasons, if consistent with management objectives, could increase forage availability.

Springs and water developments would be managed to allow riparian function while providing livestock with watering access, increasing potential distribution and available forage. Restoration of riparian/wetland areas would be done in a manner that did not impact livestock grazing.

Impacts to livestock grazing from the management of special status plant species would be similar to Alternative A.

Increased inventory and detection of noxious weeds to protect commodity resources and increase public education would likely increase or maintain current levels of forage available to livestock.

If management for water resources, water quality, and fish and aquatic habitat is implemented, impacts to livestock grazing would be similar to Alternative A. Corridor fencing of all streams would decrease the available forage to livestock. This would occur through a direct loss of forage and a decrease in the potential distribution of animals.

Most management actions for wildlife, wildlife habitat, and special status animal species would have impacts similar to Alternative A. Reestablishment of big sagebrush in seedlings could decrease the forage available to livestock.

The permitted use would be increased to 180,541 AUM's, a 10 percent increase above the current permitted use level. The utilization level would be increased to 60 percent to provide for the additional AUM's. Changes in allotment management plans and other activity plans would be required. The full permitted use level for each allotment would continue to be evaluated by allotment through rangeland health assessments, allotment evaluations, allotment management plans, watershed analyses, plan amendments, and implementation of biological opinions. Changes in forage allocation would be made, where needed, on an allotment-specific basis. These additional AUM's, combined with temporary nonrenewable grazing use

authorized in years of favorable growing conditions and the use of range improvement projects to meet resource objectives, would result in an increase in forage available to livestock grazing.

Wild horse management would have impacts similar to Alternative A.

ACEC, WSA, and significant cave management would have impacts similar to Alternative A.

Up to 64,000 acres of prescribed burn treatments and wildland fires would be allowed annually. The compliance with air quality standards would result in no impact to livestock grazing. Fire would cause a decrease in forage available for livestock use in the short term, requiring changes in livestock grazing use. Short-term impacts of emergency fire rehabilitation would include grazing exclusion following rehabilitation. Use of prescribed fire and rehabilitation of wildfire areas to optimize the forage base would result in an increase in forage quality and quantity available to livestock over the long term.

Development of recreational opportunities and OHV use could decrease forage available to livestock. The potential for loss in animal condition due to OHV use causing stress to the animals would be similar to Alternative A.

Mineral exploration and development could impact forage production in localized areas similar to Alternative A. However, the extent of these impacts would be greatest of all the alternatives.

Future acquisition or exchange of lands would have the potential to increase or decrease the forage available to livestock. Land that would facilitate commodity production would be emphasized for acquisition. This would have the potential to increase the forage available to livestock grazing. Disposal would include land within 14 allotments (Zone 3 shown on Map L-3 of the Draft RMP/EIS). One of these allotments would lose most of its land mass and result in the unavailability of 1,970 AUM's to livestock.

### **Alternative C**

Permanent closure of an additional 50,497 acres (compared to Alternatives A, B, and D) to grazing in order to emphasize natural values in plant communities would directly decrease the availability of forage for livestock. Indirectly, a decrease in the development of range improvements would likely result in decreased livestock distribution and a loss of forage available to

livestock. The reestablishment of native species in areas where nonnative species of high forage value currently exist, as well as the permanent or temporary closures associated with these projects, could result in a decrease of forage available to livestock. If the areas that would be rehabilitated to native species currently contain species of little or no value to livestock, and the areas would eventually be reopened to grazing, there could be an increase in forage available to livestock. Native seeding would still result in more forage available to livestock than if no rehabilitation was conducted. There could be an increase in the amount of time an area is excluded from grazing following rehabilitation; however, this impact would be short term and would not ultimately affect available forage.

Depending on the type of treatment within quaking aspen stands, changes in livestock grazing use could be required. Increased amount and quality of forage could be available for livestock use after treatments have been applied.

By increasing the inventory and detection of weeds and eradicating and restoring all existing sites, there would be an increase in available forage. Expanding public education efforts would be beneficial to livestock through a decrease in weed spread and introduction. This increased forage availability could potentially lead to more allocation of forage to livestock, or an increase in forage quality, allowing better condition and health of the animals.

The impacts to livestock grazing in regard to special status plant species would be applicable to a broader area than in either Alternatives A or B. The decrease in available forage would likely be greater due to the length of time areas could be closed to grazing and the size of areas closed to grazing. This would also be true for five of the areas that are proposed to be designated as ACEC/RNA's that contain special status plant species. Grazing would be excluded from these areas, resulting in a decrease in forage available to livestock.

The protection and restoration of watershed function and processes, and meeting the surface and groundwater water quality standards, would impact livestock grazing in several ways. Initially, management efforts to attain these goals could require changes in the frequency, intensity, and season of livestock use. Animals could have limited access to water, decreasing livestock distribution and indirectly decreasing forage availability. The long-term impacts could include improved animal health due to improved range condition, the opportunity to increase livestock numbers in rehabilitated areas, continued changes in forage

available to livestock, and increases in water availability due to improved watershed health. Exclusion of grazing from all streams, springs, riparian areas, wetlands and their associated riparian conservation area would result in a direct decrease to forage available for livestock. Indirectly, loss of access to water sources could limit distribution in areas where grazing can continue and ultimately decrease forage availability. The exclusion of livestock from all riparian areas would directly decrease the quantity and quality of forage available by making the forage in those areas inaccessible to the animals. This loss could be more significant in quality of forage than quantity.

Providing for aquatic habitat may result in adjustments to livestock grazing use and potentially require changes in frequency, intensity, and season of use. Grazing systems and livestock exclusion necessary to manage for instream processes and habitat diversity, state water quality standards for fish or other aquatic beneficial uses, proper functioning condition, riparian potential, and riparian management objectives would potentially result in one or a combination of the following: changes in frequency, intensity, and season of livestock use; decreased or increased forage availability for livestock; and/or increased water availability for livestock. Grazing closures would result in a permanent loss of forage available to livestock. If stream habitat goals and objectives are not being met, livestock grazing use could be adjusted. Implementing BMP's to limit sediment loading in streams would improve water quality and water availability to livestock. If future acquired wetlands are a continuation of wetlands and riparian areas present in adjacent BLM land, water availability to livestock would have the potential to increase and persist. There would be no potential to increase available forage if there is no development of new water sources. This could also impact the quality and quantity of current available forage by limiting the opportunity to increase livestock distribution in an area.

The impacts from wildlife management would result in broader impacts to livestock grazing than those from Alternatives A and B because of the emphasis on landscape scale resolution. The allocation of additional forage for elk, deer, and bighorn sheep, and the readjustment of total AUM's in allotments with mule deer and pronghorn habitat, would have no effect on the current AUM's allocated to livestock grazing. Reestablishment of native big sagebrush wildlife habitat could decrease the available forage for livestock grazing on native rangeland or seedings, depending on current conditions. Grazing systems and livestock exclusion necessary to manage for desired future habitat condi-

tions could potentially result in one or a combination of the following changes in frequency, intensity, and season of livestock use or changes in forage availability for livestock. Depending on the desired condition, forage available to livestock could increase or decrease. Adjustments to livestock grazing use in 46 allotments containing pronghorn winter forage and 81 allotments containing mule deer winter forage could occur. If management includes exclusion of grazing, there could be a loss of forage availability. Ultimately, a loss in forage for livestock during specific seasons would occur, most likely a decrease in fall use. This would have minimal impact as there are few permits currently issued for fall grazing. There would be no authorization of domestic sheep grazing, resulting in a complete loss of forage availability for that species. This would not impact the current forage available to livestock grazing as all current permits are for cattle.

Livestock grazing management would incorporate the needs of special status animal species and corresponding habitats and the “Recovery Plan for the Native Fishes of the Warner Basin and Alkali Subbasin” (USDI-USFWS 1998). Potential impacts could include changes to current livestock grazing intensity, frequency, and season of use.

Permitted use would be decreased to 86,587 AUM’s, a 48 percent reduction from the current level of permitted use. The full permitted use level for each allotment would continue to be evaluated by allotment through rangeland health assessments, allotment evaluations, allotment management plans, watershed analyses, plan amendments, and implementation of biological opinions. Changes in forage allocation would be made, where needed, on an allotment-specific basis. By not authorizing temporary nonrenewable grazing use, there would be no additional AUM’s available for livestock above those licensed. Indirectly, the abandonment of range projects would decrease the available forage for livestock by decreasing the ability to distribute livestock, as necessary, to utilize forage available in specific areas.

Restoration activities in plant communities in the Paisley Desert wild horse herd management area would increase forage available for livestock grazing; however, the forage allocated for livestock would probably reflect the current allocation. Any additional water developments constructed for horses would aid in the distribution of livestock, depending on placement. The abandonment of established water developments and other projects that do not emphasize natural values would reduce the water available to livestock and wild horses, along with decreasing distribution opportunities

and available forage.

A total of nine existing or proposed ACEC’s would be closed to grazing, creating a loss of 11,011 AUM’s of forage available to livestock on about 96,171 acres. The Devils Garden Allotment would no longer be available for emergency livestock grazing. Closure of the Arrow Gap Allotment to grazing would result in a loss of 160 AUM’s to livestock. In order to incorporate the management of three eligible WSR corridors, livestock grazing use could require changes in frequency, intensity, and season of use. Grazing is already excluded from all three of these stream corridors, resulting in a loss of forage available to livestock.

Limiting land-disturbing activities within identified Native American religious sites or traditional cultural properties could include closure of areas to grazing. This would decrease the forage available to livestock, potentially resulting in a reduction of AUM’s. Management of cultural plants would potentially require changes in frequency, intensity, and season of use of livestock grazing, also resulting in reduced available forage and AUM’s. There would also be a potential for decreasing the quality of forage available to livestock.

Reduction in commodity use to increase the level of protection for natural values would likely have a direct impact to livestock in the form of reduced forage availability. By establishing reduced commodity use levels meant to establish stability to the local livestock industry, there would be an initial loss in forage availability that could result in higher probability of available forage in the future.

The amount of acres treated by prescribed and wildland fires and the subsequent rehabilitation of these areas would result in the greatest potential increase in forage quality and quantity available to livestock (in areas not excluded to grazing). Fire would decrease available forage in the short term, requiring changes in livestock grazing use. Short-term impacts of emergency fire rehabilitation include grazing exclusion following the rehabilitation. The length of time an area would be closed to grazing could be increased, depending on individual site conditions found during monitoring. In the long term, vegetation could return with improved species diversity and increased forage quantity and quality. The emphasis on natural landscapes and processes could potentially provide less forage available to livestock than the practice of using nonnative and native/nonnative seed mixtures, as outlined in Alternatives A, B, and D. However, this would be site-dependent, and ultimately, any rehabilitation would increase favorable site conditions following a fire and

could provide more forage than is currently available in degraded and senescent plant communities.

Any expansion or development of recreation sites that exist within grazing allotments would have the potential to decrease the forage available for livestock use. Limiting most OHV use to existing roads and trails would prevent the potential decrease in forage availability and would decrease the probability of animal condition loss due to stress that could occur under other alternatives.

Mineral exploration and development would impact forage production in localized areas, but less so than Alternatives A or B.

The acquisition of lands with emphasis on land with high public resource values could increase or decrease the forage available for livestock grazing, depending on the public values at the time. A number of allotments include land that have been identified for disposal (Zone 3 shown on Map L-4 of the Draft RMP/EIS). Significant forage loss is unlikely, due to the fact that the total amount of land that could be disposed is minimal in each allotment.

#### **Alternative D**

Changes in grazing management to attain a trend toward the desired range of conditions in upland native shrub steppe communities could decrease the forage available to livestock in the short term. These management changes should benefit livestock grazing in areas that currently contain invasive and undesirable plant species. Although the management of nonnative seeding to maintain seeding production, improve structural and species diversity, and maintain forage production may not change the current quantity of available forage, it could make the current amount of available forage persist for a longer period of time. These efforts would result in short-term forage loss due to changes in grazing management immediately after project implementation. The long-term impact of rehabilitation efforts in areas that include annual, weedy, invasive woody, and decadent species would be an increase in available forage. Using a mixture of native and nonnative seeds for rehabilitation would result in more forage available to livestock than if no seeding was done. However, the amount of increase would depend on the success of the rehabilitation effort.

Riparian and wetland vegetation management could include management actions that exclude grazing or change the grazing system and season of use, both

short and long term, to promote the recovery of riparian systems.

Continuing the current integrated management of noxious weed species while expanding efforts to inventory and detect new infestations, would benefit livestock by decreasing the opportunity for undesirable species to displace quality forage.

Special status plant species management impacts would be similar to Alternative C.

Water resource/watershed health management impacts would be similar to Alternative C. Exceptions include six allotments that currently have stream reaches determined to be functioning-at-risk or nonfunctioning. These allotments would be impacted in the short term by excluding grazing for up to 5 years, decreasing the quality and quantity of forage available to livestock. If, through the rangeland health assessment process, the existing grazing system is determined to be a contributing factor to the undesirable condition, changes would be incorporated into the grazing system to promote riparian recovery. The long-term impacts could include improved animal health due to improved range condition, the opportunity to increase livestock numbers in rehabilitated areas, continued changes in forage available to livestock, decreases in forage availability depending on the grazing system changes, and increases in water availability due to improved watershed health.

Management for fish and aquatic habitat could require future changes in grazing management, including decreases in the quantity and quality of forage available to livestock grazing due to changes in grazing systems, including exclosures.

Bighorn sheep management and the allocation of an additional 8,390 AUM's to wildlife would not have an impact on livestock forage availability. These additional AUM's are currently unallotted for any specific use. Management of upland habitat would have impacts similar to Alternative C. Current livestock grazing management would potentially require changes in frequency, intensity, and season of use to incorporate management of upland wildlife habitat. Resulting impacts could include a decrease in forage available to livestock and the exclusion of grazing in specific areas. Adjustment to livestock grazing use in 46 allotments containing pronghorn winter forage and 81 allotments containing mule deer winter forage could occur. A loss in forage for livestock during specific seasons would occur, most likely a decrease in fall use. This would be minimal, as there currently is not a large amount of fall

livestock use.

Management would emphasize landscape-level resolution rather than single special status animal species management, resulting in impacts similar to Alternative C. These would be greater than those from Alternatives A and B because of the emphasis on landscape-scale resolution.

The average authorized use level (108,234 AUM's) would continue; however, the current permitted use level of 164,128 AUM's could be authorized annually. The full permitted use level for each allotment would continue to be evaluated by allotment through range-land health assessments, allotment evaluations, allotment management plans, watershed analyses, plan amendments, and implementation of biological opinions. Changes in forage allocation would be made, where needed, on an allotment-specific basis. Administrative solutions to meet resource management needs would not affect the quantity of forage available to livestock. Although temporary nonrenewable grazing use could be authorized, there may not be as much forage available to livestock as in Alternative A. Additional herbaceous production could be retained for values other than forage production.

Increasing the gather cycle for wild horses and the subsequent increases of the appropriate management level by 40 horses (Paisley Desert Herd Management Area) could affect forage available to livestock in the Sheeprock and Christmas Lake Allotments. Horse numbers have exceeded this appropriate management level in the recent past, and any impact to livestock grazing through this increase would be minimal.

The Devils Garden Allotment would no longer be available for emergency livestock grazing, slightly reducing AUM's available to livestock. Closure of the Arrow Gap Allotment to grazing would result in a loss of 160 livestock AUM's. Impacts from the designation and management of SMA's would be greater than Alternative A, but less than those in Alternative C. WSA and cave management would have the same impacts as Alternative A.

Impacts to livestock grazing by proposed cultural and paleontological resource management under would be similar to Alternative C.

Reduction in commodity use to increase the level of protection for natural values would likely have a direct impact to livestock in the form of reduced forage availability. By establishing new commodity use levels, meant to establish stability to the local livestock

industry, there could be an initial loss in forage availability that could result in an increase in available forage in the future.

In areas not excluded from grazing, wildland and prescribed fires, followed by rehabilitation, would result in an increase in available forage. Short-term impacts of emergency fire rehabilitation could include grazing exclusion following the rehabilitation. In the long term, vegetation may return with improved species diversity and increased forage available for livestock grazing. Prescribed fire treatment areas would have a decrease in forage available for livestock use in the short term, requiring changes in livestock grazing use. In the long term, these same fire treatment areas would have an increase in quantity and quality of forage available for livestock use.

Any expansion or development of recreation sites within grazing allotments would have the potential to slightly decrease the available forage. Livestock grazing use would potentially require changes in frequency, intensity, and season of use, and could be limited in these recreation areas. Although there would be no organized OHV events off of existing or designated roads and trails, there would be a large area (Tables 3-5 and 4-5) designated open to OHV use (Map R-7), creating a high potential to decrease available forage and animal condition due to stress.

Mineral exploration and development would impact forage production in localized areas similar to Alternative A.

Impacts of land disposal (Zone 3 shown in Map L-5) and acquisition would be similar to Alternative C.

### **Alternative E**

There would be a complete loss of forage available to livestock as grazing permits authorizing an average 108,234 AUM's annually would be canceled. No rangeland projects in support of livestock grazing would be planned or implemented. Rangeland projects that support livestock grazing only and are not needed for other purposes would be abandoned and rehabilitated.

### **Summary of Impacts**

Alternative A would allow the management goal for livestock grazing to be met. Management practices outlined under this alternative would support the rangeland health standards and guidelines. If livestock are determined to be the causative agent in the

nonattainment of a standard, then corrective actions would be taken. Management actions that could result in reductions in forage available to livestock and loss of management flexibility, as well as management actions that could increase forage and retain management flexibility, are present under this alternative. The actions proposed would generally allow for grazing management flexibility. Permitted AUM's would remain the same as currently permitted under the present management. Impacts to livestock grazing would be minimal, with the potential to slightly increase or decrease forage availability.

Alternative B would allow the management goal for livestock grazing to be met. Management practices outlined under this alternative would support the rangeland health standards and guidelines. If livestock are determined to be the causative agent in the nonattainment of a standard, corrective actions would be taken. Management actions that could result in reductions in forage available to livestock and loss of management flexibility, as well as management actions that could increase forage and retain management flexibility, are present under this alternative. The actions proposed would generally allow for grazing management flexibility. Permitted AUM's would reflect a 10 percent increase from those permitted under the present management. Livestock grazing would be benefit under Alternative B, with the potential to increase forage availability due to the emphasis on commodity production and an increase to a 60 percent forage utilization level.

Alternative C would allow the management goal for livestock grazing to be met. Management practices outlined under this alternative would support the rangeland health standards and guidelines. If livestock are determined to be the causative agent in the nonattainment of a standard, then corrective actions would be taken. Management actions that could result in reductions in forage available to livestock and loss of management flexibility, as well as management actions that could increase forage and retain management flexibility, would occur. The actions proposed would generally allow for grazing management flexibility. Permitted AUM's would reflect a 48 percent decrease from those currently permitted. Impacts to livestock grazing would likely be more apparent and longer-lasting than the impacts from Alternatives A and B. This is due to the actions under Alternative C emphasizing natural values and processes over commodity production. Although this emphasis could be achieved with grazing, there would be more constraints on this use and a loss of forage available to livestock.

Alternative D would allow the management goal for livestock grazing to be met. Management practices outlined under this alternative would support the rangeland health standards and guidelines. If livestock are determined to be the causative agent in the nonattainment of a standard, then corrective actions would be taken. Management actions that could result in reductions in forage available to livestock and loss of management flexibility, as well as management actions that could increase forage and retain management flexibility, would occur. The actions proposed would generally allow for grazing management flexibility. Impacts to livestock grazing would likely be more apparent and longer-lasting than the impacts from Alternatives A and B, but not as drastic as those in Alternatives C or E. This is due to the actions under Alternative D protecting and improving natural values while providing commodity production.

Implementation of Alternative E would eliminate livestock grazing on public lands in the planning area, and thus would have the most detrimental impact to livestock grazing of all the alternatives. The management goal for livestock grazing would not be met.

#### **Cumulative, Indirect, and Secondary Impacts**

Although impacts to livestock grazing from any individual management action under Alternative A are negligible, there would be potential for actions to have a greater impact when considered cumulatively. It is anticipated that the recreational use of public lands would continue to increase. There would be potential for impacts to livestock grazing, as well as loss of forage, if individual users have conflicts with the livestock or resource damage increases with the recreational use. Livestock grazing in areas with heavy recreational use may need to be modified. Presently, management of elk and bighorn sheep does not impact livestock grazing. Future management of greater sage-grouse habitat could include actions that impact livestock grazing. Any changes to the management of wildlife species recommended by ODFW may result in the need to change grazing systems and seasons of use. When combined, management of OHV use, mineral development, cultural, paleontological, and land disposal may decrease the available forage for livestock if multiple actions occurred in the same allotment.

Under Alternative B, impacts to livestock grazing would generally increase the forage available to livestock. Increased opportunity for prescribed fire to optimize the forage base and rehabilitation using high forage value species would increase the forage avail-

able to livestock. These efforts, combined with range-land improvements, would promote the use of currently unavailable or undesirable areas. Commodity production would include actions that impact livestock grazing in situations where other commodities are emphasized. Where other commodity-based resources are present, cumulative impacts could result in a loss of forage. Presently, management of elk and bighorn sheep does not impact livestock grazing. Any changes to the management of wildlife species recommended by ODFW could result in the need to change grazing systems and seasons of use. Future management of greater sage-grouse habitat could include actions that impact livestock grazing. When combined, management of recreation, OHV use, mineral development, cultural, paleontological, and land disposal could decrease the available forage for livestock if multiple actions occurred in the same allotment.

The cumulative impacts to grazing under Alternative C could be significant. Allotments that have the most potential of being impacted would be those where grazing is the causative agent in nonattainment of rangeland health or other standards. These areas may contain special status plants and wildlife, aquatic habitat, wildlife habitat, streams, riparian areas, and recreational opportunities in need of rehabilitation. Impacts would be greater if management activities required complete livestock exclusion and/or loss of present forage base. Closure of an area to recreation use could increase recreation use in other areas. This could result in decreased forage availability and use conflicts.

Under Alternative D, impacts to livestock grazing would generally not affect the total AUM's available to livestock. In a case-by-case basis, there could be cumulative impacts to the forage selection and quality of forage. Management actions that include wildlife, such as greater sage-grouse, elk, and bighorn sheep, combined with other resource issues in an area, could decrease the forage available to livestock. Any closure to recreation in one area may not directly impact livestock grazing. Indirectly, use in other areas could increase and impact forage availability for livestock.

Under Alternative E, livestock grazing would be eliminated from the planning area. There would be no secondary, indirect, or cumulative impacts to the program.

## Wild Horses

**Management Goal—***Maintain and manage wild horse herds in established herd management areas at appropriate management levels to ensure a thriving natural ecological balance between wild horse populations, wildlife, livestock, vegetation resources, and other resource values.*

### *Assumptions*

All wild horses removed from the herds would be placed in the BLM's adoption program or otherwise placed for long-term care. Under Alternative B, increases in livestock grazing would not result in improper rangeland management. Therefore, more intensive grazing systems and range improvement projects would be required under this alternative.

### *Analysis of Impacts*

#### *Alternative A*

Management of nonnative seedings within herd management areas benefit wild horses by providing a stable forage base and reducing competition with domestic livestock for nonnative forage.

Special status plant species occur in both the Paisley Desert and Beaty Butte Herd Management Areas. Management designed to benefit special status plant species could limit opportunities to enhance wild horses and conflict with the needs of wild horses, especially if protective fencing is used.

Weed management actions could limit the spread of noxious weeds, reducing impacts on forage production in the herd management areas.

The watershed health goals would benefit wild horses by providing stable or increased forage production and availability. Existing grazing systems and exclosures on streams, springs, and riparian/wetland areas would benefit wild horses in the long term, as improved health of streams, springs, and riparian/wetlands provide a longer time period of water availability and improved forage production and availability.

Forage needs of wildlife, livestock, and wild horses are met under current management strategies. Bighorn sheep occur in both herd management areas. In most instances, the habitats of bighorn sheep, livestock, and wild horses do not overlap. An exception would be near waterholes where animals concentrate. If manage-

ment objectives for wildlife and livestock are not achieved, adjustments in appropriate management levels may be necessary to meet other resource objectives. Current livestock levels could be maintained without reductions in appropriate management levels. When wild horse numbers increase above appropriate management levels with no corresponding reduction in livestock numbers, key areas become overgrazed and forage production and availability decrease. Impacts to resources are compounded during periods of drought, resulting in decreased health of wild horses.

Grazing systems and range improvements designed to improve ecological condition would increase forage production and provide a stable environment for wild horses, as long as increased forage production is not entirely consumed by livestock. Under these conditions, appropriate management levels could be maintained and overall health of the herds would improve. When livestock use is balanced with forage production, horses would have adequate forage during the summer and prior to winter. Adequate forage would help maintain the health of the herds and assist in maintaining viability. Livestock grazing would continue to be managed under a rest/rotation system in both herd management areas. Based on previous studies, rest/rotation grazing results in significantly better conditions than all other systems. Vegetation changes would benefit wild horses as herbaceous vegetation increases. Most change would occur on rangelands in mid-seral condition in both herd management areas.

Viable herds of wild horses would be maintained in balance with the forage and other resources. Herd characteristics described in Table 2-32 would be maintained. Horses from outside the herd management areas could be introduced to maintain genetic diversity. Genetic diversity would improve the health of the herds. Returning only the highest quality horses after gathering ensures that the herds would be highly reproductive and would be one of the most significant factors influencing the viability of the herds.

The current appropriate management level and forage allocation for horses would remain as shown in Table 2-29. The present forage allocation underestimates the needs of wild horses at the middle to upper end of the appropriate management level. Forage is currently allocated for the original number of horses in the herd management areas (85 in the Paisley Herd Management Area and 200 in the Beaty Butte Herd Management Area). After horses increase above these levels, they would be over the forage allocation.

Construction of new boundary fences or strengthening

existing fences would encourage horses to stay inside herd management areas. Therefore, all impacts from wild horse use would be confined within the herd management areas.

New fencing designed for watershed restoration, fire rehabilitation, range improvement, livestock management, or protection of special status species would temporarily restrict movement of wild horses until they became accustomed to the change. During drought years, fences could prevent horses from reaching water sources, and actions such as leaving gates open and water hauling may be necessary to maintain the herds. Fencing affects the entire Paisley Desert Herd Management Area, which has approximately 46 miles of interior fencing. Grazing allotments within the boundaries of the herd management area include Allotments 418, 419, 428, and 10103. Fencing would be less of an impact to the Beaty Butte Herd Management Area, which has only 9 miles of interior fencing in one allotment (600). The fencing in the Beaty Butte Herd Management Area is constructed so that horses may move around the fence on the east side. No further interior fencing would occur in either herd management area.

Water developments benefit wild horses as well as livestock, because water is more limiting than forage in the herd management areas. Livestock operators would continue to maintain water developments used by wild horses. No further water developments would be recommended in the Paisley Desert Herd Management Area. As many as nine water projects would be recommended for the Beaty Butte Herd Management Area. Water development could allow for better health of animals during periods of drought and could increase the area used by horses.

Aggressive initial attack and full suppression of wildland fires would minimize short-term impacts to horses, such as loss of forage. Prescribed fire would reduce availability of forage on up to 9,000 acres in the Beaty Butte Herd Management Area in the short term until vegetation recovered from fire impacts. In the long term, vegetative productivity of herbaceous species and diversity of plant species may be maintained or increased with prescribed fire. An increase in herbaceous vegetation would benefit wild horses by increasing the available forage. Prescribed fire or wildland fire in the Paisley Desert Herd Management Area could reduce the amount of forage available in both the short and long term due to the risk of invasion from cheatgrass and noxious weeds.

Vegetation management designed for rehabilitation and

restoration of disturbed lands including seedings, sagebrush control, and prescribed or wildland fire, would reduce forage availability and habitat on approximately 20,000 acres in the short term, pending vegetative recovery from the initial disturbance. In the long term, vegetative productivity and diversity would be maintained or improved, and the viability and health of the herds would be maintained.

Mineral exploration and development would have a low probability of occurrence within herd management areas; therefore, minimal impacts would be expected. However, these activities could potentially occur anywhere in the planning area. A diatomite mine exists in the Paisley Desert Herd Management Area. Potential impacts from mineral activity include displacement of horses, loss of forage, interruption of normal movements, and change in normal areas of use.

#### **Alternative B**

Vegetation treatments would benefit livestock more than wild horses. More available forage would be allocated to livestock, possibly increasing competition with wild horses. Downward adjustments in appropriate management levels could become necessary, as more emphasis is placed on livestock use of the forage.

Noxious weed treatment, watershed health, wildland fire and prescribed fire, recreation and OHV use, and energy and mineral exploration and development would have the same impacts as Alternative A. Management for special status species would have the same impacts as Alternative A. The need to fence special status plants could be greater; therefore, the impacts described in Alternative A are more likely to occur.

Temporary nonrenewable grazing use would benefit livestock rather than horses, but would not negatively impact horses.

Viable herds of horses would be maintained in both herd management areas.

#### **Alternative C**

Impacts from most resource management actions would be similar to Alternative A, except the majority of negative impacts would be reduced. A significant positive effect to horses would result. Emphasis on natural values would limit the opportunities to enhance wild horse populations because appropriate management levels would not be maximized.

The impact from short-term forage loss as a result of

proposed vegetation and restoration projects would have less of an impact than Alternative A because less emphasis would be placed on livestock use of forage.

Conflicts with livestock for available forage and water would be reduced. Grazing systems and range improvements, designed to improve ecological condition, would have impacts similar to Alternative A. Protection of springs in the Beaty Butte Herd Management Area may result in loss of water for wild horses. This could be offset by water developments elsewhere in the herd management area. Maintaining utilization levels in the light range on uplands would assure adequate forage availability for horses. Slight long-term increases in birth rates could be expected, along with increased winter forage, decreased winter deaths, and a general improvement in herd health. Herd characteristics would be maintained.

There would be less potential for project development and less impacts to horses from project development.

Fencing would have the same impacts as Alternative A, although the amount of fence necessary for livestock management could be reduced.

Road closures may limit the time during which gathering could be scheduled and the placement of trap sites used in gathering. The potential for wild horse and human interactions would be reduced to benefit wild horses.

#### **Alternative D**

Most impacts would be the same as Alternative A, except that forage allocation for wild horses and livestock would be proportional. Grazing systems and range improvements, designed to improve ecological condition, would have similar impacts as Alternative A but would benefit wild horses as well as livestock.

The viability of wild horse herds would be maintained consistent with other uses. Established appropriate management levels would be increased initially and then maintained. Slight long-term increases in birth rates could be expected, along with increased winter forage, decreased winter deaths, and a general improvement in herd health. Herd characteristics would be maintained.

#### **Alternative E**

Competition between livestock and wild horses for available forage would be eliminated. Wild horses would be managed within the existing boundaries of

herd management areas and within the capabilities of the resources. Appropriate management levels could be revised until a level of “thriving ecological balance” is determined. Resource deterioration from overgrazing would not be allowed. Fencing within herd management areas would be removed, maximizing the area in which horses could roam freely. Healthy, viable herds would be maintained.

Gathers of excess horses would continue, but the time period between gathers could potentially be increased.

Minimal new project construction would occur. Existing water holes would be maintained. New water developments would be considered only if survival of the horses depended on the water.

The potential for long-term loss of habitat from wildland fire would be highest under this alternative.

### **Summary of Impacts**

Under Alternative A, the objectives would be met with viable populations of wild horses maintained in both herd management areas. Appropriate management levels would remain constant in both herd management areas. In some instances, conflicts with livestock production and special status species could occur.

Under Alternative B, wild horse herds would be impacted more than in Alternative A, because forage would be allocated to livestock before wild horses. Periodic downward adjustments of appropriate management levels may be necessary to ensure that wild horses are managed consistent with meeting other management objectives. Gathering excess horses would likely occur more often than in the past in order to meet objectives commodity production. Increased gathering would increase stress on the herds.

Under Alternative C, the objectives for wild horses would be met and viable populations of wild horses would be maintained. Conflicts could occur on a site-specific basis. Herd health would be improved. The appropriate management levels would remain constant or could potentially increase. The appropriate management levels would remain the same as Alternative A.

Under Alternative D, the overall impacts to wild horses would be slight and positive. The objectives for wild horses would be met and viable populations of wild horses would be maintained. Conflicts may occur on a site-specific basis. Herd health would be improved as vegetation improves and forage is increased.

Under Alternative E, wild horse appropriate management levels could be maximized because there would be no competition from livestock grazing. Viable healthy herds of horses would be maintained. Few conflicts would occur. The highest threat would be loss of habitat from wildland fire.

Implementation of Alternatives A, C, and D, with constraints on livestock management, limited additional fence construction, management of wildland fire, and range improvement projects, would best meet management objectives to maintain and manage viable herds of horses in established herd management areas, considering other multiple-use objectives. The proposed emphasis on livestock production, recreational use, and other commodity values in Alternative B, would increase disturbance of wild horses. Forage, habitat, and water sources for horses could be restricted. Wild horse herds could be maximized under Alternative E consistent with maintaining their habitat and forage resources to support viable, healthy herds of horses in the long term.

### **Secondary, Indirect, and Cumulative Impacts**

Indirect impacts to horses generally occur after a stress event, such as gathering. Indirect impacts may include spontaneous abortions, increased social displacement of band members, and conflicts such as brief skirmishes between studs.

Cumulative impacts under all alternatives would result in an annual average increase in horse numbers of 20 percent. Horses would be expected to adapt to changes such as increased vehicle use over time. Horses would adapt to changes in availability and distribution of critical habitat components of food, shelter, water, and space. Since the horses would be monitored and gathered periodically under all alternatives, they should be able to remain healthy within their existing herd areas. Increases in livestock numbers above that described in Alternative B could impact wild horse numbers in the long term and require downward adjustments in appropriate management level numbers—otherwise horses would remain at current appropriate management levels.

Wild horses could cause cumulative impacts to unfenced private land in the Beatty Butte Herd Management Area. Approximately 9 percent of the herd management area is private land, characterized as rangeland similar to that described for BLM land. Many of the springs in the herd management area occur on private land. Private lands provide a good forage base for horses, but grazing competition is at a high

level.

Cumulative impacts may occur as horses move to and from the Sheldon National Wildlife Refuge. Even though fencing along Highway 140 isolates most bands of horses from the Sheldon National Wildlife Refuge south of the highway, some interchange between herds does occur. If bands from the refuge mix with those in the Beaty Butte Herd Management Area, population-wide impacts, such as modification of age and sex ratios and separation of members of individual bands, may occur. Feral horses may be removed from the refuge in the future. Wild horses from the Beaty Butte Herd Management Area may continue to move onto the refuge.

## Special Management Areas

### **Areas of Critical Environmental Concern and Research Natural Areas**

**Management Goal—*Retain existing and designate new areas of critical environmental concern (ACEC's) and research natural areas (RNA's) where relevance and importance criteria are met and special management is required to protect the identified values.***

#### ***Impacts Common to Several Alternatives***

Wildland fires would not be expected to have significant, long-term impacts to ACEC/RNA values, due to the fact that the plant communities found in these areas are generally adapted to fire and are in good condition. However, fire suppression actions could cause significant impacts. Using heavy equipment to suppress wildland fires in existing and proposed ACEC/RNA's would require line officer approval. This restriction would help to protect the relevant and important resource values in ACEC/RNA's. Any rehabilitation of wildland fires would be done using native seed. The use of prescribed fires in ACEC/RNA's would promote naturalness by reintroducing fire into the ecosystem.

Under Alternatives A, B, and D, livestock use would continue based on existing permit stipulations and approved allotment management plans and would have little or no impact on relevant or important values. Plant community cells and other important resources would be monitored over time to determine if there are any impacts from grazing. The adaptive management process would be used to identify mitigation for grazing impacts. Any proposed future changes in

grazing, including time and intensity of use, would be evaluated for impacts on the relevant and important values and would be permitted if the values would be maintained or enhanced. Existing livestock use would be adjusted where adverse impacts are identified using a variety of methods, including but not limited to fencing, reduction in livestock numbers, changes in grazing season, or exclusion. Proposed projects would be evaluated for impacts and permitted where relevant and important values would be maintained or enhanced. Under Alternatives C (Map G-2 of Draft RMP/EIS) and E, livestock grazing would be removed from most existing and proposed ACEC/RNA's and the associated impacts would not occur. This would be a significant benefit to the existing plant communities as healthy representations of natural systems would have a better chance of surviving over the long term, promoting biodiversity.

Under Alternatives C and D, Tribal people would have better access to traditional resources and use areas in eight of the ACEC's established, in part, for cultural resources and plants. This would ensure the sustainability of these resources so that they will be available for traditional and ceremonial practices in the future.

Under Alternatives B, C, and D, ACEC/RNA's would be managed as land tenure Zone 1 (Maps L-3 and -4 of the Draft RMP/EIS and L-5), thereby retaining these lands in Federal ownership/management. In addition, inholdings would be a high priority for future acquisition. This would improve the manageability of these areas.

#### ***Analysis of Impacts: Devils Garden ACEC***

##### ***Alternatives A-D***

Under Alternatives A and B there would be little or no change in current management or associated impacts. The area would continue to be protected from the impacts of new right-of-way locations and most mineral development, as well as managed as VRM Class I under the wilderness IMP (USDI-BLM 1995b), preserving the area's naturalness and scenic character.

Maintaining closures of trails created since the wilderness inventory was completed (Alternatives A-D) and permanent closure of the road into the Devils Garden in the center of the lava flow (Alternative C only) and to Derrick Cave (Alternatives C and D) (Map SMA-5) would protect these areas from impacts of vehicle use, soil compaction, and disturbances to natural character, as well as return these areas to more natural conditions.

Under Alternative D, all roads in the area prior to the wilderness inventory would be seasonally closed (Table 4-4; Maps SMA-5 and -24). This would decrease harassment of wintering mule deer and bighorn sheep, as well as limit other vehicle impacts.

#### **Alternative E**

Under this alternative, no impacts would be expected as long as the area is in WSA status. If the area is not designated as wilderness and is removed from WSA status, the integrity and scenic quality of the south end of the Lava Flow would be impacted as a result of mineral material disposal. OHV use on existing roads in the garden would impact the naturalness of the area.

#### **Analysis of Impacts: Lake Abert ACEC**

##### **Alternatives A–D**

Under Alternatives A–D, the Lake Abert ACEC would be retained. The impacts of Alternative A are described in detail in the “High Desert Management Framework Plan Amendment and Final Environmental Impact Statement for the Lake Abert Area of Critical Environmental Concern (ACEC) in Lake County, Oregon” (USDI-BLM 1996d).

Under Alternatives A and B, the size of the ACEC would not increase. Protection of resources would be provided by limiting OHV use to existing roads and trails and avoiding location of new rights-of-way. Retaining the ACEC designation would continue to provide protection and management direction for cultural resources. Alternative A would limit the amount of impacts from mineral leasing in portions of the ACEC. Impacts of Alternative B would be similar to Alternative A, except that Lake Abert would be opened to exploration, development, and mining of lakebed evaporite mineral salts. This would most likely occur at the north end of the lake. Such activity would have a negative impact on the water cycle of the lake, alter the water chemistry, and negatively impact the shorebird habitat that has recently gained world-wide recognition.

Under Alternatives C and D, Abert Rim WSA would be added to the ACEC. The entire WSA would be limited to designated roads and trails. Closures of trails created since the wilderness inventory was completed would be maintained. Proposed road closures are shown in Table 4-4 and Map SMA-7. OHV use around Lake Abert would be limited to existing roads and trails. This would limit access to certain areas, including areas with large numbers of cultural sites or arti-

facts.

#### **Alternative E**

The ACEC designation would be revoked, thereby removing special management to protect cultural, scenic, and biological values. The national historic district would remain in effect, protecting cultural values. Lake Abert would be open to exploration, development, and mining of lakebed evaporite mineral salts. Impacts from mineral activity would be the same as Alternative B.

#### **Analysis of Impacts: Lost Forest/Sand Dunes/Fossil Lake ACEC/RNA**

##### **Impacts Common to Alternatives A–D**

The Sand Dunes WSA would continue to be protected from the impacts of new right-of-way locations and most mineral development, as well as managed as VRM Class I under the wilderness IMP (USDI-BLM 1995b). Under Alternatives B–D, the boundary adjustments (Map SMA-9) would focus management actions in a more logical area that the BLM could readily influence and make management more efficient.

##### **Alternatives A and B**

The entire ACEC would remain open to camping. This would result in continued impacts from camping use, such as tree cutting for fire wood (even though the area is currently closed to firewood cutting), obliterating vegetation, disturbing soil, and vandalizing trees and rock formations in the Lost Forest RNA, particularly around Sand Rock. Development of a campground under Alternative B, either by the BLM or a private party, would help to reduce these impacts. Impacts would be contained and concentrated in an area specifically designed for high use.

The Sand Dunes would continue to be open to OHV use. In 2000, the BLM desired to find out if current management in the Sand Dunes was affecting the natural migration of the dunes, as well as how the migration might affect the surrounding area, such as the Lost Forest RNA. Aerial photographs taken of the dune field over the last 60 years were examined to document dune dynamics and migration patterns of the dune field. Other parameters (wind, precipitation, sand origin, particle size, dune shape, present movement, active, partially active, stabilized) and presence or absence of vegetation, were also examined. Since 1939, the areas on the southwestern edge of the dune

field and east of Fossil Lake have been active, moving about 5-10 meters to the east per year, covering about a hectare per year. However, one small section has had no net movement of sand at all. Two small areas within the northeast section of the Lost Forest have had very little movement and in one area appears to have retracted. The areas due west of the Lost Forest have averaged less than 1 meter of movement per year. It appears that what little sand movement spills off of dunes is piling up between the trees. The area of the largest dunes west of Lost Forest and south of County Road 5-14E was hard to assess quantitatively. Qualitatively, no measureable dune movement was detected. The overall conclusions suggest that between 1939 and 1994, the migration rates in the dune field were not sensitive to changes in climate or human use (Desert Research Institute 2001).

The existing Fossil Lake fence enclosure would continue to protect paleontological and cultural sites from damage by OHV's, livestock trampling, and other disturbances. However, there would be no protection for newly-discovered paleontological and cultural sites in the sand dunes outside the enclosure. The management of most of the area as VRM Class I would benefit other resource values. Upgrading BLM Road 6151 through the Lost Forest would reduce impacts from vehicles driving off road to avoid muddy or rocky areas (i.e., soil compaction, damage to vegetation, and erosion). The restrictions on location of new rights-of-ways and mineral development would protect most of the ACEC/RNA, except Fossil Lake.

#### **Alternative C**

The limited effects of past grazing would be eliminated by prohibiting grazing within the ACEC's, thus improving the soils for microbiotic crusts, improving survival of grasses and forbs (perennial and annual), returning plant litter to the soil, and providing for greater productivity.

The maximum protection of paleontological and cultural resources would result from eliminating OHV use from the ACEC, limiting the size of the existing powerline corridor, retaining the mineral withdrawal in the Lost Forest RNA, and removing livestock grazing from the entire area. Implementing these actions would reduce the possibility of surface disturbance of cultural sites by up to 90 percent.

Closing the Lost Forest section of the ACEC to camping (day use only) would reduce vehicle and human use in fragile disturbed areas, especially around Sand Rock. This would also help eliminate the illegal cutting of

trees for firewood and the vandalism of trees and rocks in the area. OHV activity would be prohibited in the entire ACEC. This would have a positive effect on the area as negative vehicle and human effects on dune vegetation and in the Lost Forest would be eliminated. The management of most of the area as VRM Class I would benefit other resource values similar to Alternative A. The restrictions on location of new rights-of-way and mineral development would protect most of the ACEC/RNA.

#### **Alternative D**

The size of the Fossil Lake closure area would be increased (Table 3-3; Map SMA-9A) to prevent damage to paleontological resources by OHV use. The expanded closure area would be fenced, which would protect artifacts that are found outside the existing fenced area. Outside the enlarged fenced area, the sand dunes would still be open to OHV use, which could result in some cultural and paleontological sites and artifacts being unearthed and destroyed. Protection of cultural and paleontological resources would be less than under Alternative C, but more than under Alternatives A and B. Continued livestock grazing could also damage these resources.

Within the existing enclosure of Fossil Lake, native vegetation has returned and is stabilizing the sandy area. This stabilization would be expected to occur in the enlarged enclosure area of low dunes. Rotating use of the camping and staging areas in the dunes would give those areas a chance for rehabilitation and vegetation. Development of a campground either by the BLM or a private party would reduce the disturbance associated with camping. Impacts would be contained and concentrated in an area specifically designed for such use. The inner dunes would have a chance to recover from damage, including soil disturbance, erosion, and destruction of vegetation caused by OHV use. Providing designated access routes between a campground and the dunes would further limit impacts to soil and vegetation caused by OHV's. The management of most of the area as VRM Class I would benefit other resource values similar to Alternative A. The restrictions on location of new rights-of-way and mineral development would protect most of the ACEC/RNA.

#### **Alternative E**

The impacts to cultural, paleontological, and biological resources would be similar to Alternative C, since the Sand Dunes would be closed to OHV's. Much of the area would continue to be protected by the wilderness

IMP (USDI-BLM 1995b) and restrictions on new rights-of-way or mineral development.

***Analysis of Impacts: Warner Wetlands ACEC***

***Alternatives A–D***

Under Alternatives A–D, the ACEC would be retained and management direction and protection of the important resources would continue as at present. The impacts of this management are described in detail in the “Warner Lakes Plan Amendment for Wetlands and Associated Uplands” (USDI-BLM 1989b).

Conducting noxious weed management in accordance with the “Warner Basin Weed Management Area Plan” (USDI-BLM 1999g) would have positive impacts on plant communities in the area. Changing the grazing use in the meadow management area under Alternatives C and D would not impact the ACEC as a whole.

Limiting OHV use to designated roads and trails would result in 28–60 miles of roads being closed (Table 4-4; Map SMA-10), depending on alternative, potentially reducing soil compaction and erosion. Reducing vehicle access would also reduce disturbance to wildlife. Continuing management of the area as VRM Class III would not impact other resource values.

Mineral development would be restricted only in the eastern half of the ACEC. Future development in the western half could have significant impacts. New rights-of-way would be excluded under Alternative C and avoided under Alternative D, both of which would restrict the potential amount of disturbance allowed from these activities.

***Alternative E***

The ACEC designation would be revoked and some fences not needed to protect wildlife habitat would be removed. This could open the area to more vehicles and people, which could result in more disturbance to soil, vegetation, and wildlife, as well as vandalism and illegal collecting of artifacts at cultural sites.

***Analysis of Impacts: Proposed Abert Rim Addition to Lake Abert ACEC***

***Impacts Common to Alternatives A–D***

Conducting noxious weed management in accordance with the “Abert Rim Weed Management Area Plan” (USDI-BLM 1995e) would have positive impacts on

plant communities in the area. The area would continue to be protected from the impacts of new right-of-way locations and most mineral development, as well as managed as VRM Class I under the wilderness IMP (USDI-BLM 1995b).

***Alternatives A and B***

Abert Rim would not be added to the existing Lake Abert ACEC. Though the area would continue to be managed under the wilderness IMP (USDI-BLM 1995b), this would not provide special management direction and protection for the cultural and traditional cultural properties which have been identified, should Abert Rim WSA be dropped from wilderness consideration by Congress.

***Alternative C***

About 18,049 acres would be added to the Lake Abert ACEC, providing special management direction and protection for significant cultural and traditional cultural properties located within the addition area. Limiting OHV use to designated roads and trails would result in about 16 additional miles of roads and trails being closed, potentially reducing soil compaction and erosion.

***Alternative D***

About 18,049 acres would be added to the Lake Abert ACEC, providing special management direction and protection for significant cultural and traditional cultural properties located within the addition area. Continued grazing could cause trampling of cultural sites. Limiting OHV use to designated roads and trails would result in about 3.3 additional miles of roads and trails being closed (Table 4-4; Map SMA-7), reducing soil compaction and erosion.

***Alternative E***

The existing Lake Abert ACEC designation would be revoked and Abert Rim ACEC would not be designated. This would eliminate any special protection and management for cultural resources in the area. However, cultural resources would be generally protected, since neither livestock grazing, mining, nor any other commercial activities would be allowed. Recreation use would continue; therefore, there could be damage to cultural sites from illegal artifact collecting or vandalism.

ing a variety of treatment methods, would cost-effectively reduce fuel hazards to acceptable levels and achieve both ecosystem health and resource benefits. Fire management programs and activities should be based upon protecting resources, minimizing costs, and achieving land management objectives. They must also be economically viable. ICBEMP also stresses the use of fire to restore and sustain ecosystem health based on sound scientific principles and information. This must also be balanced with other societal goals, including public health and safety, air quality, and other specific environmental concerns. Finally, ICBEMP states that prescribed fire should be considered in wilderness areas where it has been determined that wildland fire use for resource benefit would not achieve desired rates of ecosystem maintenance or restoration.

Sound risk management is a foundation for all fire management activities. Risks and uncertainties relating to fire management activities must be understood, analyzed, communicated, and managed as they relate to the cost or consequences of either doing or not doing an activity.

#### ***Management Common to Alternatives A–D***

A fire management plan would be updated for the LRA soon after completion of the RMP. The fire management plan would identify conditions and potential locations for wildland fire use and for prescribed fires, as well as other factors pertaining to fire management in LRA.

For Alternatives A, B, C, and D, treatment acres refer to those areas analyzed in an environmental assessment; it does not assume that 100 percent of those acres are treated. The intent is to actually treat approximately 40–70 percent of the area, and keep 30–60 percent untreated. A goal of landscape-level treatment is to break up treated and untreated areas in a mosaic effect. The acres listed in the alternatives are upper limits for analytical purposes, and not targets. For Alternatives C and D, wildland fire use may cause the number of treated acres to vary widely from year to year, and in some years may accomplish a very large number of treated acres. Lightning-caused fires in excess of 100,000 acres have occurred periodically in the rangeland fuels on the LRA.

Areas burned by prescribed fire would be rested from grazing for a minimum of two growing seasons. Rest for less than two growing seasons may be justified on a case-by-case basis. Under Alternative C only, the area would be rested for a minimum of two full years. Other temporary use restrictions, such as no off-road

travel, may be imposed where warranted.

#### ***Management Direction by Alternative***

##### ***Alternative A***

Use prescribed fire and mechanical, chemical, and biological hazardous fuels reduction treatments on a case-by-case basis to improve forage base and restore natural processes. There are no areas designated for wildland fire use. The Fort Rock Fire Management Area is managed for appropriate suppression response, rather than wildland fire use. Many fires occurring within the Fort Rock Fire Management Area boundaries are monitored and allowed to be extinguished naturally. For the past 5 years, BLM has prescribed burned approximately 5,000 to 20,000 acres per year (this is approximately 0.15 to 0.6 percent of the LRA). There have been very little mechanical hazardous fuels reduction treatments on the LRA. Appendix B of the “Lakeview Grazing Management EIS” (USDI-BLM 1982a) describes mechanical/chemical treatments to shrub/western juniper habitats, few of which have been implemented to date.

##### ***Alternative B***

Under this alternative, prescribed fire and mechanical, chemical, and biological hazardous fuels reduction treatments would be used primarily to enhance commodity production and enhance the forage base for livestock. Therefore, landscape-level treatments would not occur under this alternative. There would be no areas designated for wildland fire use. No more than 2 percent of the resource area (64,000 acres) would be treated annually by prescribed fire or mechanical methods under this alternative; less than 10 percent (320,000 acres) would be burned or mechanically treated for hazardous fuels reduction in a 10-year period.

##### ***Alternative C***

Under this alternative, prescribed fire, mechanical, chemical, and biological fuel treatments, and wildland fire use would be emphasized to restore natural processes, and to protect, maintain, and enhance natural resources. Emphasis would be placed on using prescribed fire for restoration of degraded rangelands. Areas for possible wildland fire use would be determined under this alternative, but would be further analyzed in the fire management plan. The Fort Rock Fire Management Area would no longer be managed for appropriate suppression response, but would be

managed for wildland fire use. No more than 20 percent of the resource area (640,000 acres) would be treated annually by prescribed fire, mechanical fuel treatments, and wildland fire use combined under this alternative. Less than 50 percent (1,600,000 acres) would be treated in a 10-year period.

#### **Alternative D**

Under this alternative, prescribed fire, mechanical, chemical, and biological fuel treatment, and wildland fire use would be used to: protect, maintain, and enhance natural resources; restore degraded habitats; and protect other adjacent Federal, state and private land. Areas for wildland fire use would be determined under this alternative, but would be further analyzed in the fire management plan. The Fort Rock Fire Management Area would no longer be managed for appropriate suppression response, but would be managed for wildland fire use. No more than 15 percent of the resource area (480,000 acres) would be treated annually by prescribed fire, mechanical fuel treatment for hazard reduction, and wildland fire use under this alternative. Less than 35 percent (1,120,000 acres) of the resource area would be treated in a 10-year period.

#### **Alternative E**

Under this alternative, there would be no prescribed fire, no mechanical, chemical, and biological fuel treatments for hazard reduction, and no wildland fire use for resource benefit.

## **Recreation Resources**

***Management Goal—Provide and enhance developed and undeveloped recreation opportunities, while protecting resources, to manage the increasing demand for resource-dependent recreation activities.***

#### ***Rationale***

The FLPMA provides for recreation use of public land as an integral part of multiple use management. Dispersed, unstructured activities typify the recreational uses occurring throughout the majority of the LRA. Policy guidelines in BLM Manual 8300 direct the BLM to designate special units known as special recreation management areas. Management within these special recreation management areas focuses on providing recreation opportunities that would not otherwise be available to the public, reducing conflicts among users, minimizing damage to resources, and reducing visitor

health and safety problems. Major investments in recreation facilities and visitor assistance are appropriate in special recreation management areas when required to meet management objectives.

Public lands not designated as special recreation management areas, or other special designations, are managed as extensive recreation management areas. Management direction within extensive recreation management areas focuses on actions to facilitate recreation opportunities by providing basic information and access. Visitors in extensive recreation management areas are expected to rely heavily on their own equipment, knowledge, and skills while participating in recreation activities.

In accordance with FLPMA, the “BLM’s Recreation—A Strategic Plan” (USDI-BLM 1990) sets recreation policy on the national level. The policy emphasizes resource-dependent recreation opportunities that typify the vast western landscapes; striving to meet the social and economic needs of present and future generations, providing for the health and safety of the visitor, and accomplishing these goals within the constraints of achieving and maintaining healthy ecosystems.

#### ***Actions Common to Alternatives A–D***

Under Alternatives B, C, and D, the North Lake Special Recreation Management Area (Maps R-1 and -8 of the Draft RMP/EIS and map R-9) and extensive recreation management area designations would become effective upon signature of the approved RMP and record of decision. An individual recreation area management plan outlining specific management for the North Lake Special Recreation Management Area would be prepared following publication of the approved RMP.

All areas within the LRA not covered under a special designation, such as WSA’s, special recreation management areas, ACEC’s, etc., would be managed as an extensive recreation management area.

Recreation area management plans would not be prepared for the extensive recreation management areas. Specific management actions or projects in the extensive recreation management areas would be included in individual project plans or in plans written for SMA’s following publication of the approved RMP.

Any recreational use within ACEC’s, including commercial and noncommercial uses authorized under special recreation permits, would be evaluated and permitted, modified, or prohibited as needed to protect ACEC values. However, camping would be prohibited

in a few of the ACEC's under Alternatives C and D.

Throughout the LRA, occupancy and use for recreational camping is limited to 14 consecutive days. Camping within 300 feet of any water source is prohibited. A water source is defined as any fenced spring enclosure, flowing spring, man-made metal or concrete water tank or trough, or dirt pond.

Designation of additional scenic byways or vehicle routes would be considered, provided they are consistent with OHV designations and resource concerns are addressed. Existing scenic byway designations would remain.

Under Alternatives B, C, and D, designation of the North Lake Special Recreation Management Area is proposed.

Operations for all wilderness therapy groups authorized within the proposed North Lake Special Recreation Management Area would be limited to the following area: east of County Road 5-12 B and BLM Road 6121, and north of Lake County Road 5-14. Adjacent to the proposed North Lake Special Recreation Management Area there are a number of campsites associated with wilderness therapy operations located within the Prineville and Burns Districts that are addressed under this RMP process. Within the Prineville District campsites are located in Sections 4, 14, and 34, T.22S., R.19E.; Sections 1 and 3, T.23S., R.19E.; Sections 15 and 36, T.23S., R.20E.; Sections 19, 29, and 33, T.23S., R.12E.; and Sections 5, 8, and 23, T.24S., R.21E. Campsites within the Burns District are located in Sections 4, 13, 22, and 26, T.25S., R.22E., and Section 2, T.26S., R.22E.

### ***Management Direction by Alternative***

#### ***Alternative A***

Under this alternative, management of the existing Warner Wetlands Special Recreation Management Area would continue and the remaining public land throughout the LRA would be managed as an extensive recreation management area. Possible future designation of special recreation management areas to enhance tourism and recreation opportunities would be considered. Existing developed and undeveloped recreation sites (including trails, wildlife viewing areas, back country byways, interpretive areas, and campgrounds) would be expanded to accommodate increased visitation. Opportunities for partnerships to expand tourism and recreation would be optimized. Recreation experiences would be provided through increased information

and education opportunities.

Commercial recreation opportunities would be continued through the authorization of special recreation permits consistent with present management direction while providing for resource protection. Special recreation permits, for both commercial and noncommercial activities, would be authorized throughout the LRA.

The Sunstone Collection Area would be managed under existing guidelines, where there would be no commercial collection of stones, and only hand tools may be used.

Development of a watchable wildlife site on the north end of Abert Lake would be considered.

Wilderness therapy schools would be authorized, through the issuance of special recreation permits, to operate on BLM-administered lands within the LRA and portions of the Prineville and Burns Districts. Total user days (defined as any calendar day, or portion thereof, that a participant/client/student is accompanied or serviced by an operator or permittee) associated with wilderness therapy school operations may not exceed 16,600 for combined use in Lakeview, Prineville, and Burns Districts. Group size would be limited to nine students, plus staff. In the vicinity of Fredericks Butte in north Lake County, no wilderness therapy schools would be authorized to operate with more than two groups at any one time within Lakeview, Burns, and Prineville Districts. No more than five groups would be authorized to operate concurrently within this area. When possible, no campsites would be authorized within 5 miles of any year-round residence.

### ***Special Recreation Management Areas***

#### ***Warner Wetlands Special Recreation Management***

**Area:** Management of the Warner Wetlands Special Recreation Management Area would be as outlined in the "Warner Wetlands Recreation Area Management Plan" (USDI-BLM 1990). Existing management direction allows hunting, motorized boating, and personal motorized watercraft (jetskis and waverunners) use. Vehicles would be required to stay on designated roads and trails. The following projects, previously approved to enhance and provide new recreation opportunities, would be considered:

- Upgrade approximately 12–13 miles of existing roads to provide all-weather public access to Turpin, Campbell, and Stone Corral Lakes.

Managing the area as VRM Class III would provide little protection to other resources. Mineral development would have the potential to cause surface disturbance and related impacts. Mineral activity is not likely, since the area has only moderate potential for geothermal resources. Impacts associated with the location of new rights-of-way would be avoided.

#### **Alternative E**

No ACEC/RNA designation would mean no protection or special management of one ONHP plant community cell. However, since no grazing, mining, or other commercial activity would occur, the cell would exist in a more natural situation. The plant community would be monitored over time. The conservation agreement with the USFWS would provide some special management to Columbia cress.

#### ***Analysis of Impacts: Proposed Guano Creek/Sink Lakes ACEC/RNA***

##### **Impacts Common to Alternatives A–D**

The area overlaps completely with the Guano Creek WSA and would continue to be protected from the impacts of new right-of-way locations and most mineral development, as well as managed as VRM Class I under the wilderness IMP (USDI-BLM 1995b). This area would continue to be excluded from livestock grazing; therefore, related impacts would not occur.

##### **Alternatives A and B**

No ACEC/RNA designation would be made. Therefore, no special management direction and protection would be provided for the resources other than the wilderness IMP (USDI-BLM 1995b). The two ONHP plant cells identified in the area (Appendix I) could be lost in the long term. Implementing the conservation agreement with the USFWS would benefit two special status plants: Crosby's buckwheat and grimy ivesia. OHV use would continue to be limited to existing roads and trails, which could reduce off-road surface disturbance, vegetation destruction, soil compaction, and erosion.

##### **Alternative C**

Approximately 4,936 acres would be designated as an ACEC/RNA. Protective management would be put in place that would benefit the condition and continued existence of the two plant cell communities, as well as the two special status plants, even if the area were

released from wilderness study. These healthy representations of natural systems would have a better chance of surviving and representing biodiversity where surface-disturbing activities are limited. Implementing the conservation agreement with the USFWS would benefit the two special status plants.

Limiting OHV's to designated roads and trails, including closure of about 2.4 miles of existing roads and trails (Table 4-4), could reduce off-road surface disturbance, vegetation destruction, soil compaction, and erosion.

#### **Alternative D**

Approximately 11,239 acres would be designated as an ACEC/RNA (Table 4-4; Map SMA-15). The impacts would be the same as Alternative C.

#### **Alternative E**

No ACEC/RNA designation would mean no protection or special management would occur, except for that required by the wilderness IMP (USDI-BLM 1995b). Since no grazing, mining, or other commercial activity would occur, the plant community cells would exist in a more natural situation. The ONHP plant community cells and special status plants would be monitored over time. Implementing the conservation agreement with the USFWS would benefit the two special status plants.

#### ***Analysis of Impacts: Proposed Hawksie-Walksie ACEC/RNA***

##### **Impacts Common to Alternatives A–D**

The area overlaps completely with the Hawk Mountain and Sage Hen Hills WSA's and would continue to be protected from the impacts of new right-of-way locations and most mineral development, as well as managed as VRM Class I under the wilderness IMP (USDI-BLM 1995b).

##### **Alternatives A and B**

Under Alternatives A and B, no ACEC/RNA designation would be made. No additional management direction and protection would be provided. The two ONHP plant cells identified in the area, as well as the high quality grasslands unique to that area (Appendix I) could be lost in the long term. However, continued management of the area as a WSA would provide some protection. OHV use would continue to be limited to existing roads and trails which could reduce off-road

surface disturbance, vegetation destruction, soil compaction, and erosion.

#### **Alternative C**

Approximately 17,339 acres would be designated as an ACEC/RNA. Management would provide direction and protection of cultural resources. Excluding livestock and wild horses from part of the area would be a significant benefit to the plant communities in the ACEC/RNA. Limiting OHV use to designated roads and trails, including closure of about 10.5 miles of existing roads and trails, could reduce off-road surface disturbance, vegetation destruction, soil compaction, and erosion, as well as protect cultural sites from surface disturbance, destruction, and theft. These actions would also protect the two ONHP cells and the high quality grasslands.

#### **Alternative D**

Approximately 17,339 acres would be designated as an ACEC/RNA. Management would provide special management direction and protection generally similar to Alternative C. However, the areas containing the plant cells are not proposed to be excluded from livestock or wild horses initially. The ACEC would be monitored to determine impacts from grazing. Limiting OHV use to designated roads and trails, including closure of about 4.1 miles of existing roads and trails (Table 4-4; Map SMA-15), could reduce off-road surface disturbance, vegetation destruction, soil compaction, and erosion

#### **Alternative E**

No ACEC/RNA designation would mean no special provision would be made for the protection or management of the two ONHP cells or the high quality grasslands other than that provided by the wilderness IMP (USDI-BLM 1995b). Since no grazing, mining, or commercial activity would occur, these sites would exist in a more natural situation. The ONHP cell plant communities and special status plants would be monitored over time.

No ACEC/RNA designation would eliminate special protection and management for cultural resources in the area. However, cultural resources would be generally protected since neither livestock grazing nor any other commercial activities would be allowed. There could be damage to sites from illegal artifact collecting and vandalism. Recreation use and associated impacts would continue.

### ***Analysis of Impacts: Proposed High Lakes ACEC***

#### **Alternatives A and B**

No designation would be made and no additional management direction and protection would be provided for the cultural resources and cultural plants in the area outside of Guano Creek WSA (Appendix I).

#### **Alternative C**

About 40,095 acres would be designated as an ACEC. The area overlaps a small portion of the Guano Creek WSA. This area would continue to be protected from the impacts of new right-of-way locations and most mineral development, as well as managed as VRM Class I under the wilderness IMP (USDI-BLM 1995b).

This is one of the few proposed ACEC's under this alternative where livestock grazing would be allowed. However, it would be closely monitored and adjusted in the future if impacts occur.

Management actions prescribed for the ACEC would provide protection and management direction for cultural resources. These actions would significantly benefit the integrity and scientific value of cultural sites. Limiting surface-disturbing activities and adjusting grazing use (if required) would benefit cultural plant species, ensuring their abundance and sustainability. This would be a benefit to local Tribes who desire to be able to harvest these plants for traditional or ceremonial uses.

Limiting OHV's to designated roads and trails and closure of about 23 miles (Table 4-4) of roads and trails could reduce off-road surface disturbance, vegetation destruction, soil compaction, and erosion, as well as protect cultural sites from surface disturbance, direct destruction of artifacts, and vandalism often resulting from human access. Managing most of the area (outside of the WSA) as VRM Class III would provide little protection for other resources.

Closing the area to sale and lease of minerals and excluding new rights-of-way would protect resources from surface disturbance and related impacts.

#### **Alternative D**

About 38,985 acres would be designated as an ACEC.

ACEC management actions would provide additional protection and management direction for cultural resources. Impacts to cultural plants and Native

American use of the area and plants would be the same as Alternative C.

OHV use would be limited to designated roads and trails and would include closure of about 17.8 miles of roads and trails (Table 4-4; Map SMA-16). This could reduce off-road surface disturbance, vegetation destruction, soil compaction, and erosion, as well as protect cultural sites from surface disturbance, direct destruction of artifacts, and vandalism often resulting from human access.

The area would be subject to future potential mining impacts of surface disturbance and resource damage. Impacts associated with new rights-of-way would be avoided.

Other impacts would be similar to Alternative C, but to a lesser degree since this alternative would be less restrictive.

#### **Alternative E**

No ACEC would be designated. This would eliminate any special protection and management for cultural resources and cultural plants in the area. However, cultural resources and plants would generally be protected since neither livestock grazing, mining, or any other commercial activities would be allowed. Recreation use would continue. There could be damage to sites from illegal artifact collecting and vandalism. Although Native Americans and others would still be able to harvest cultural plants, these plants would have no special protection or management. Long-term impacts on their continued existence would be uncertain.

#### ***Analysis of Impacts: Proposed Juniper Mountain ACEC/RNA***

##### **Alternatives A and B**

No ACEC/RNA designation would be made. No additional management direction and protection would be provided. The one ONHP plant cell identified in the area, as well as old growth juniper woodland unique to that area (Appendix I) would not receive special management. The eastern half of this area burned in a lightning-caused wildfire in the summer of 2001. Some live stands of juniper remain. Restricting vehicles to existing roads and trails would facilitate revegetation of the area. If woodcutting is allowed to continue within the ACEC, it would be limited to dead and down material near existing roads and trails.

#### **Alternative C**

About 6,335 acres would be designated as an ACEC/RNA. All commercial wood or plant collection would be prohibited. This would have some short-term and long-term positive impacts on biological resources. Closing the area to wood cutting would protect the ecological and scientific values associated with the remaining old growth juniper woodland. Firewood for personal use could be made available immediately north and east of the ACEC within invasive juniper stands that burned in 2001 (Map V-3).

This is one of the few proposed ACEC's under this alternative where livestock grazing would be allowed. However, it would be closely monitored and adjusted in the future if impacts occur.

Closing the area to camping and limiting OHV's to designated roads and trails, along with closure of about 6.7 miles of roads and trails (Table 4-4), could reduce off-road surface disturbance, vegetation destruction, soil compaction, and erosion, as well as allow natural processes to operate, allow recovery from the fire, and facilitate continued research. Managing the area as VRM Class II would provide protection for other resource values.

Closing the area to the sale or lease of minerals and excluding new rights-of-way would eliminate disturbance impacts associated with these activities.

#### **Alternative D**

About 6,335 acres would be designated as an ACEC/RNA. Firewood for personal use would be made available immediately north and east of the ACEC within invasive juniper stands that burned in 2001 (Map V-3).

No impacts from camping would be expected as long as live trees were not cut for use as camp firewood. Limiting OHV's to designated roads and trails, along with closure of about 4.3 miles of roads and trails (Table 4-4; Map SMA- 17), could reduce off-road surface disturbance, vegetation destruction, soil compaction, and erosion, as well as allow natural processes to operate, allow recovery from the fire, and facilitate continued research. Managing the area as VRM Class IV would provide little or no protection for other resource values.

Although mineral exploration and development could cause surface disturbance and related impacts, it is not likely due to the relatively low mineral potential in the

area (Maps M-8, -9, and -10). Mineral leasing activity would be subject to a no-surface-occupancy stipulation. This would protect the integrity of the remaining woodland. New right-of-way locations and associated impacts would be avoided.

All other impacts would be the same as those described under Alternative C.

#### **Alternative E**

There would be no ACEC/RNA designation. There would be no commercial activity, including woodcutting, livestock grazing, or mineral development. Therefore, no negative impacts would be likely to occur. Recreational use of the area, including camping, would continue with no expected impact. Scientific study and research would continue.

#### **Analysis of Impacts: Proposed Rahilly-Gravelly ACEC/RNA**

#### **Alternatives A and B**

No ACEC/RNA designation would be made. No additional management direction and protection would be provided for the relevant and important resources in the area. The one ONHP plant cell identified, as well as the one special status plant species unique to the area, Cooper's goldflower (Appendix I), would not receive special management and could be lost in the long term.

About two-thirds of the ACEC/RNA is within the Crump Geyser Known Geothermal Resource Area. Geothermal exploration and development would be likely in the future. This could cause a significant negative impact to the special status plant, cultural plants, and cultural sites in the area, depending on how the activity is conducted. Stipulations would be attached (Appendix N3) to any lease issued to protect the special resources in the area to the extent possible.

#### **Alternative C**

About 20,127 acres would be designated as an ACEC/RNA. This is one of the few proposed ACEC's under this alternative where livestock grazing would be allowed. However, it would be closely monitored and adjusted in the future if impacts occur.

Management direction would provide protection for cultural resources. These actions would significantly benefit the integrity and hence, the scientific value of

cultural sites. Limiting surface-disturbing activities and adjusting grazing use to meet the needs of cultural plants would benefit these species and ensure their abundance and continued survival. Allowing collecting of vegetative material including cultural plants would allow Native Americans to continue to use the area for traditional purposes. It would provide one more area for sustainable cultural plant collection. This would be a benefit to the Tribes who desire to harvest these plants for traditional or ceremonial uses.

Limiting OHV use to designated roads and trails, including closure of about 11.8 miles of roads and trails (Table 4-4), could reduce off-road surface disturbance, vegetation destruction, soil compaction, and erosion. Managing the area as VRM Class III would provide little protection to other resource values.

Closing the area to mineral sale and placing a no-surface-occupancy stipulation on mineral leasing would limit mining related impacts. Geothermal exploration or development would have to be done from outside the area, which would eliminate any impacts to cultural resources or plant communities and special status species. Excluding new rights-of-way would eliminate disturbance impacts associated with this activity.

#### **Alternative D**

About 19,648 acres would be designated as an ACEC/RNA. Management direction would provide protection for the resources. Most impacts would be similar to Alternative C. Impacts to the plant community cells, the special status plant, and cultural plants and their use by local tribes would be the same as Alternative C.

Limiting OHV use to existing roads and trails could reduce off-road surface disturbance, vegetation destruction, soil compaction, and erosion, but not as much as Alternative C. Managing the area as VRM Class III would provide little or no protection to other resources.

Some protection would be provided by restricting mineral leasing to no surface occupancy. Impacts from mineral sale or location could still occur. New rights-of-way and associated impacts would be avoided.

#### **Alternative E**

No ACEC/RNA would be designated. This would eliminate special protection and management for cultural resources. However, cultural resources, cultural plants, and other botanical values in the area would be generally protected, since neither livestock

grazing, mining, or any other commercial activities including geothermal exploration and development would be allowed. Recreation use would continue. There could be damage to sites from illegal artifact collecting and vandalism. Although Native Americans and others would still be able to harvest cultural plants, these plants would have no special protection or management. Long-term impacts on their continued existence would be uncertain.

### ***Analysis of Impacts: Proposed Red Knoll ACEC***

#### ***Impacts Common to Alternatives A–D***

Noxious weed treatment would benefit native plant communities in the area and would be similar under these four alternatives.

#### ***Alternatives A and B***

No ACEC designation would be made. No special management direction would be provided for two special status plant species, a number of cultural plants, and an abundance of cultural resource sites (Appendix I).

#### ***Alternative C***

About 11,588 acres would be designated as an ACEC. Management direction would provide protection of cultural resources. Limiting surface-disturbing activities and eliminating grazing (Map G-2) would prevent damage or destruction of cultural plants and the special status plants in the area. Allowing collecting of vegetative material, including cultural plants for individual use, would enable Native Americans to continue to use the area for traditional or ceremonial purposes and provide one more area for sustainable cultural plant collection.

Limiting OHV use to designated roads and trails, including closure of about 7.3 miles of roads and trails (Table 4-4), could reduce off-road surface disturbance, vegetation destruction, soil compaction, and erosion, as well as direct destruction of artifacts, which would significantly benefit the integrity and hence, the scientific value of cultural sites. Managing the area as VRM Class II would provide protection to other resources.

Withdrawing the area from mineral location, closing the area to mineral sale or lease, and excluding the location of new rights-of-way would prevent surface disturbance and destruction of cultural resources.

#### ***Alternative D***

About 11,127 acres would be designated as an ACEC. Management direction would provide protection for cultural resources. Impacts to cultural plants and special status plants would be similar to those under Alternative C, except that livestock grazing would continue. However, grazing could be adjusted to reduce impacts to cultural plants or special status plants, if necessary.

Limiting OHV use to designated roads and trails, including closure of about 3.8 miles of roads and trails (Table 4-4; Map SMA-19), could reduce off-road surface disturbance, vegetation destruction, soil compaction, and erosion, and would significantly benefit the integrity and hence, the scientific value of cultural sites. However, the protection would not be as great as under Alternative C. Managing the area as VRM Class II would provide protection to other resources.

Closing approximately 4,600 acres of the area (where mineral potential is highest and development is most likely to occur) from mineral location (by withdrawal), sale, or lease would eliminate potential impacts from mining in part of the ACEC. However, the remainder of the area would remain open to mineral development, subject to special stipulations (Appendix E3). Mining related impacts could occur in this part of the area. New rights-of-way and associated impacts would be avoided.

#### ***Alternative E***

No ACEC would be designated. This would eliminate any special management for cultural resources in the area. However, cultural resources would be generally protected since neither livestock grazing, mining, or other commercial activities would be allowed. Recreation use would continue. There could be damage to sites from illegal artifact collecting and vandalism.

No special provision would be made for the management of the two special status species; however, since no grazing, mining, or commercial activity would occur, the plants would exist in a more natural situation. These plants would be monitored over time. Similarly, cultural plants would exist in a more natural situation and Native Americans and others would still be able to harvest them. However, the long-term impacts on their continued existence would be uncertain.

***Analysis of Impacts: Proposed Spanish Lake ACEC/  
RNA***

***Alternatives A and B***

No ACEC/RNA designation would be made. No additional management direction and protection would be provided for the resources. The two ONHP plant cells identified in the area (Appendix I) would not receive special management and could be lost over time.

***Alternative C***

About 4,699 acres would be designated an ACEC/RNA. This is one of the few proposed ACEC's under this alternative where livestock grazing would be allowed. However, it would be closely monitored and adjusted in the future if impacts occurred.

Limiting OHV use to designated roads and trails, including closure of about 4.4 miles of roads and trails (Table 4-4), could reduce off-road surface disturbance, vegetation destruction, soil compaction, and erosion. Managing the area as VRM Class III would provide little or no protection to other resources.

Closing the area to sale or lease of minerals and excluding new rights-of-way would protect the two plant cell habitats by reducing potential vegetation loss and soil disturbance.

***Alternative D***

About 4,699 acres would be designated as an ACEC/RNA.

Limiting OHV use to designated roads and trails, including closure of about 0.6 miles of roads and trails (Table 4-4; Map SMA-20), could reduce off-road surface disturbance, vegetation destruction, soil compaction, and erosion. Managing the area as VRM Class IV would provide little or no protection to other resources.

The area would remain open to mineral development and the potential for related impacts. The area has a moderate potential for geothermal resources. Exploration or development could impact the two plant cells by destroying vegetation, by driving vehicles off-road, or by constructing access roads. Geothermal leases would be issued with stipulations (Appendix E3) to protect resources to the extent possible. Location of new rights-of-way and associated impacts would be

avoided.

***Alternative E***

No designation would mean no special provision would be made for the management of the two ONHP plant community cells; however, since no grazing, mining, or commercial activity would occur, the plant communities would exist in a more natural situation and would be monitored over time.

***Analysis of Impacts: Proposed Table Rock ACEC***

***Impacts Common to All Alternatives***

The special status plants, Cusick's buckwheat and snowline cymopterus, would continue to benefit from management and protection provided by the existing conservation agreement with USFWS.

***Alternatives A and B***

No ACEC designation would be made. No additional management direction would be provided for the cultural resources and cultural plants in the area (Appendix I).

***Alternative C***

About 5,891 acres would be designated as an ACEC. Management direction would provide protection of cultural resources. Actions that limit surface disturbance would reduce direct destruction of artifacts, thereby maintaining the integrity and hence, the scientific value of cultural sites. These actions would also reduce impacts to special status plants.

Closing the area to camping and limiting OHV use to designated roads and trails, including closure of about 11.1 miles of roads and trails (Table 4-4), could reduce off-road surface disturbance, vegetation destruction, soil compaction, and erosion. Managing the area as VRM Class II would provide protection to other resources.

Closing the area to sale and lease of minerals and excluding new rights-of-way would eliminate impacts from these types of activities.

***Alternative D***

About 5,138 acres would be designated as an ACEC. Impacts would be similar to Alternative C; however, protection would not be as great. Management direc-

tion would provide protection of cultural resources. This is one of the few proposed ACEC's under Alternative D where livestock grazing and the associated impacts would continue to be excluded from part of the area.

Limiting camping use to designated areas and OHV use to designated roads and trails, including closure of about 3.6 miles of roads and trails (Table 4-4; Map SMA-21), could reduce off-road surface disturbance, vegetation destruction, soil compaction, and erosion. Managing the area as VRM Class II would provide protection to other resources.

The area would be closed to mineral sale. The area has a moderate potential for geothermal resources, but would be restricted by a no-surface-occupancy stipulation. This would eliminate potential impacts from these types of activities. New rights-of-way and associated impacts would be avoided.

### **Alternative E**

No ACEC would be designated. This would eliminate any special cultural resources in the area. However, cultural resources would be generally protected, since neither livestock grazing, mining, or any other commercial activities would be allowed. Recreation use would continue. There could be damage to sites from illegal artifact collecting and vandalism.

### **Summary of Impacts**

Under Alternative A, no new ACEC's would be designated and four existing ones would be retained. The overall impact on currently designated ACEC's would be generally beneficial, although a lack of restrictions on certain activities in some ACEC's leaves them vulnerable to adverse change. Twelve areas with identified relevant and important values would not be designated as ACEC/RNA's, and would therefore, not receive a priority for special management. The overall impact could be adverse in undesignated areas. The ACEC objectives would be met generally in the four existing ACEC's as priority for management would be extended to these areas.

Under Alternative B, four existing ACEC's would be retained and only one new area, Connley Hills, would be designated. The overall impact on the existing and the one proposed ACEC would be somewhat beneficial. Smaller areas within ACEC's would receive special management attention. Eleven potential ACEC's would not be proposed. The overall impact could be adverse in these undesignated areas. Empha-

sis on commodity uses would increase the risk of adverse impacts. The ACEC objectives would be met generally in the four existing ACEC's and the proposed Connley Hills ACEC.

Under Alternatives C and D, 4 existing ACEC's would be retained, 1 would be enlarged, and 12 new ACEC's would be designated. Nine new RNA's would be designated within nine of the ACEC's. Under both alternatives, the special management of the proposed ACEC's would help protect areas designated as ONHP plant community cells. These healthy representations of natural systems would have a better chance of surviving and providing biodiversity where no grazing is allowed and fences are constructed to limit wild horse access. Tribal people would have access to traditional resources and be able to use areas in eight ACEC's managed partially for cultural values and plants. This would ensure that these areas and resources are available for traditional and ceremonial practices in the future.

The overall impact of Alternative C on currently designated ACEC's would be generally beneficial, although a lack of restrictions on certain activities in some ACEC's leaves them vulnerable to adverse change. The emphasis on management for natural values would provide indirect benefits to the proposed ACEC's. Special management actions that mitigate adverse effects would be implemented for all activities within ACEC's. A priority for management would be extended to areas designated as ACEC's. Alternative C would provide the most extensive and most restrictive management for ACEC's. Overall, the ACEC objectives would be met for an extensive representation of relevant and important values.

In Alternative C, the impacts from livestock grazing would be significantly less because 102,412 acres within nine existing or proposed ACEC's would be closed to grazing. This would provide greater protection to special status plants and plant communities. All ACEC's would be closed to mineral sale and leasing but would remain open to locatable minerals, except for Red Knoll, where the entire ACEC would be withdrawn from mineral activity. Surface-disturbing activity associated with locatable mineral entry would be prohibited in ACEC's that overlap WSA's. (Surface disturbance requiring reclamation is prohibited in WSA's.) These actions would lessen or eliminate the negative effects of mineral development, such as road building and damage to soils and vegetation.

The overall impact on areas of existing and proposed ACEC's would be beneficial in Alternative D, although

a lack of restrictions on certain activities in some ACEC's leaves them vulnerable to adverse change. Special management actions that mitigate effects of adverse impacts would be implemented for all activities within the ACEC's. However, special monitoring of commodity use, such as livestock grazing and wild horse use, would be necessary. Overall, the ACEC objectives could be met for an extensive representation of relevant and important values.

In Alternative D, leasable mineral development is open or open with a no-surface-occupancy stipulation for the majority of the existing and proposed ACEC's. At Red Knoll, only the northern section would be withdrawn from mineral entry and would be fully protected from mineral development. Leasable mineral development is unlikely in most of the ACEC's due to low potential. However, where there is potential for development of geothermal resources (Black Hills, Connley Hills, Juniper Mountain, Rahilly-Gravelly, Sink Lakes, and Table Rock), there would be a no-surface-occupancy stipulation. This would protect the botanical and cultural resources in these areas. The Rahilly-Gravelly ACEC would be the most likely candidate for geothermal exploration and development due to the presence of the Crump Geyser Known Geothermal Resource Area. Except for the Lost Forest RNA portion of the Lost Forest/Sand Dunes/Fossil Lake ACEC and the northwest portion of Red Knoll ACEC, all other ACEC's would be open to locatable mineral development. However, no disturbance could occur in those portions of ACEC's within WSA's and the instant study area (ISA) until they are released from wilderness study. Sale of minerals would be closed for five of the ACEC's. Areas remaining open would be subject to potential adverse impacts from mineral activities.

Under Alternative E, all existing ACEC designations would be revoked and no new ACEC's would be designated. Management for these areas would be the same as that applied across the planning area. The cessation of many activities, including livestock grazing, all mineral activities, and all project development, would permit natural functions and processes to occur within the natural systems. However, the potential for increased horse numbers, nonaggressive weed control, and no management of woodland areas would result in long-term adverse impacts to relevant and important values. The management of wildland and prescribed fire would not be beneficial. There would be no prescribed fires, nor would there be rehabilitation of burned areas. Wildland fires would be allowed to burn except when endangering life or private property. These policies would create a repeated wildland fire regime, which could result in large stands of cheatgrass

and noxious weeds, which in turn would create a higher potential for repeated wildland fires. This policy would cause damage to the relevant and important values of all the ACEC's.

Recreation use would be expected to increase, particularly in areas which had been previously designated, such as the Lost Forest/Sand Dune ACEC. Unless regulated, recreation use would result in adverse impacts to cultural and natural values. Overall, impacts of recreation use are anticipated to be moderate. With limited or no noxious weed control, weeds may spread throughout the planning area, resulting in degradation of natural values and severe long-term adverse impacts to natural area communities, plant/animal interaction, and biodiversity. Overall, the ACEC objectives would not be met because this alternative does not provide the necessary protection for relevant and important values.

### ***Secondary, Indirect, and Cumulative Impacts***

The major secondary, indirect, or cumulative impacts to ACEC's would be the loss of relevant and important values, such as special status species, unique plant communities, habitats, conversion to marginal plant communities, and loss of cultural values. Up to 147,149 acres of new ACEC's and 167,020 acres of existing ACEC's would be set aside to protect and have special management for special status species (plant and animal), cultural values, scenic values, and unique plant communities. Ten RNA's within these ACEC's would be available for researchers and exist as examples of plant communities for the entire State of Oregon. The impacts from activities implemented on the adjacent USFS, USFWS, state, and private lands, create additional cumulative impacts in addition to BLM-authorized actions.

Especially noteworthy is the increase of OHV recreation in the planning area, some from the closure of sand dunes on the Oregon coast and overflow from OHV areas in the Prineville District. Changes in dunes in the Lost Forest/Sand Dunes/Fossil Lake ACEC have recently been studied by researchers to determine the cumulative impacts of OHV use. The study concluded that neither climate or OHV use have caused significant changes in dune movement patterns since 1939 (Desert Research Institute 2001). Recreation use is predicted to increase just from the increase of population in Oregon, which would have an effect on recreation sites, roads, and would have a special impact in areas of traditional congregation of campsites.

One positive cumulative impact would be the sustain-

able use of up to 122,560 acres by Tribal people for cultural resources and practices; thus fulfilling the BLM's trust responsibility.

A lack of noxious weed policies and prevention on non-BLM lands has had a negative effect on the biodiversity of the existing plant communities within ACEC's in both short and long term. Overall, there has been a loss of biodiversity.

The role of wildland fire policies in non-BLM lands could also negatively impact the existing and proposed ACEC's in the long term, especially by disturbing the connectivity of plant and animal species habitats and by changing the wildland fire regimes at the landscape level.

If Congress decides to designate those WSA's that overlap ACEC's as wilderness, the values of the ACEC's would be greatly enhanced and would receive increased protection.

## Wilderness Values

**Management Goal—Wilderness study areas (WSA's) and proposed WSA additions would be managed under the "Interim Management Policy for Lands Under Wilderness Review" (wilderness IMP) (USDI-BLM 1995b). BLM-administered land acquired since the wilderness inventory and determined to have wilderness values would be included in adjacent WSA's.**

### Analysis of Impacts

#### Alternative A

There have been no parcels of land adjacent to or within any existing WSA's assessed through the land use planning process to determine if they would be suitable for wilderness designation. Until the assessment of a specific acquired parcel of land is completed, there would be a potential for wilderness values in these parcels to be impaired because they would not be afforded the same level of protection as the wilderness IMP (USDI-BLM 1995b).

Overall, wilderness values associated within the 12 WSA's would not be degraded under current management. The Sand Dunes WSA would remain open to motorized uses. The opportunity for visual solitude within the Sand Dunes WSA is greatest within the central core where the largest dunes occur. The opportunity for visual and auditory solitude is diminished toward the boundary of the WSA; sounds from

human activities outside of the WSA influence solitude within the area as well. The continued motorized use of the Sand Dunes would preclude solitude potential, especially during periods of high use, which have typically been associated with holiday weekends such as Memorial Day, Fourth of July, and Labor Day. Over 1,000 people have been observed camping and riding OHV's within the WSA during recent Memorial Day weekends. Although holiday weekends are documented as the highest use periods, there has been a steady increase in use in OHV recreation activities observed throughout the year. There are three undeveloped camping areas located along the main access road (6151) to the Sand Dunes WSA. Concentrated vehicle use has caused soil compaction and impacts to vegetation within these areas. These areas would continue to see high use during the holiday weekends. During these high use periods, there is no opportunity for solitude in the Sand Dunes WSA. Outside of the high use periods, there are opportunities for solitude and primitive recreation experiences, but activities such as agriculture and other uses on adjacent private lands would be a negative impact to some degree. Over time, there would be more pioneered trails leading into and out of the central dunes area from these camping areas. There are 7 miles of fence within the Sand Dunes WSA, including a fence around Fossil Lake, which restricts OHV's from entering Fossil Lake from the central core area of the sand dunes. The Fossil Lake fence is noticeable on the flatter open terrain in the deflation basin on the very west portion of the WSA. However, this fence does not substantially affect the naturalness of the area.

#### Alternative B

Lands adjacent to or within existing WSA's that were acquired after the "Wilderness Study Report" (USDI-BLM 1991a) would not be added to existing WSA's. There would be limited management actions available to provide protection for any wilderness values and characteristics. This alternative does not meet the management goals for potential wilderness resources.

Overall, potential impacts to wilderness values associated with the 12 existing WSA's would be similar to Alternative A.

#### Alternative C

Approximately 1,194 acres of acquired lands within or adjacent to three WSA's (Abert Rim, Fish Creek Rim, and Guano Creek), determined to have wilderness characteristics would be recommended as suitable for wilderness designation. Adding these areas to the

existing WSA's would ensure that the wilderness characteristics and values are adequately protected.

The potential negative impacts to wilderness values from motorized uses within all of the WSA's would be lower than under either Alternatives A or B. All motorized and mechanical uses within WSA's under Alternative C would be limited to designated roads and ways; whereas under Alternatives A and B, the motorized uses would be limited to existing roads and ways.

The closure of the main road into the center of Devils Garden and the road from BLM Road 6179 to Derrick Cave would eliminate access on approximately 25 miles of roads within the Devils Garden WSA (Table 4-4). The opportunity to experience solitude, naturalness and primitive recreation activities would be enhanced with these road closures.

Closure of the Sand Dunes WSA to all OHV's would have a positive impact on the potential opportunities for experiencing primitive recreation and would improve visual and auditory solitude within the central core of the sand dunes. The opportunity for visual and auditory solitude would continue to be diminished toward the boundary areas of the WSA because of sounds and visual impacts from human activities and development outside of the WSA. With the entire area designated as day use only, the traditionally used camping areas along the main access road to the Sand Dunes would eventually revegetate and signs of past human use would diminish. The existing ways leading into and out of the core dunes area would be obliterated over time from the movement of sand and natural revegetation. Additionally, the fence separating Fossil Lake from the central core area sand dunes would no longer be necessary and could be removed. This would improve the naturalness of the area, as seen from the deflation basin located on the west portion of the WSA.

#### **Alternative D**

Approximately 1,194 acres of acquired lands within or adjacent to three WSA's (Abert Rim, Fish Creek Rim, and Guano Creek), were determined to have wilderness characteristics and would be recommended as suitable for wilderness designation. Adding these areas to the existing WSA's would ensure that the wilderness characteristics and values are adequately protected.

With the exception of the Sand Dunes WSA, motorized and mechanical uses within WSA's would be limited to either designated or existing roads and ways. Road closures within the Devils Garden WSA would be fewer than under Alternative C, and the Sand Dunes

WSA would remain open to OHV's (as in Alternatives A and B). However, the total number of acres in the open designation would be decreased by about 2,328 (Table 3-3), because the Fossil Lake closure would be increased by a corresponding amount. Camping adjacent to the main access road to the Sand Dunes would be allowed to continue, but the use would be limited to designated areas on a rotational basis. Access into the central dunes areas would be limited to specific routes and some existing pioneered trails would be closed. Over time, the naturalness of these camping areas would be improved.

Overall, the management actions proposed would have similar but slightly more positive effects on wilderness values compared to Alternatives A and B and less benefit than Alternative C.

#### **Alternative E**

The addition of 1,194 acres of acquired lands within or adjacent to Abert Rim, Fish Creek Rim, and Guano Creek would be the same as under Alternatives C and D. Motorized and mechanical uses within WSA's would be limited to existing roads and ways, and the Sand Dunes WSA would be designated closed to OHV use.

Overall, the potential effects on wilderness values from management actions proposed would be similar to Alternative C. Alternatives C and E would possibly have a slightly greater positive effect than Alternatives A, B, or D because the Sand Dunes WSA would be designated closed under Alternatives C and E.

#### **Summary of Impacts**

Overall, the management actions proposed under Alternative D would have similar effects on wilderness values compared to Alternatives A and B. Management actions proposed under Alternatives C and E would have a greater positive effect on wilderness values than Alternative D.

#### **Secondary, Indirect, and Cumulative Impacts**

The addition of acquired lands to the existing WSA's would provide protection of the wilderness characteristics and values against future development and uses which would otherwise not be available without a recommended designation as wilderness. Management of existing WSA's and acquired areas would be guided by the wilderness IMP (USDI-BLM 1995b).

## Wild and Scenic Rivers

**Management Goal—*Protect and enhance outstandingly remarkable values of rivers determined to be administratively suitable for potential inclusion in the national wild and scenic river (WSR) system until Congress acts.***

### Impact Analysis

#### Alternative A

Guano Creek, Honey Creek, and Twelvemile Creek would not be recommended administratively suitable for inclusion in the national WSR system. Guano Creek is located within the Guano Creek WSA, which would continue to provide protection of the outstandingly remarkable values under wilderness IMP (USDI-BLM 1995b). Potential designation of Guano Creek WSA by Congress as wilderness would provide a long-term level of protection similar to that afforded a designated WSR. If Congress should act to release the Guano Creek WSA from consideration, the BLM could revisit the issue and determine if the designation of Guano Creek as part of the national WSR system would be necessary to protect the outstandingly remarkable values.

As part of the Hart Mountain Jurisdictional Transfer, dated February 26, 1998 (and the Shirk Ranch Agreement, dated September 30, 1997), grazing is not authorized within the Guano Creek WSA, which includes the Guano Creek study corridor. The designation of Guano Creek as part of the national WSR system would not appreciably increase the level of protection over the current level of protection provided under the wilderness IMP (USDI-BLM 1995b) and the current management mentioned above. The most significant difference in the protections provided through potential wilderness designation and potential designation in the national WSR system is in the area of energy development. Under a wilderness designation, energy development (e.g., hydropower dams) could be authorized by the President, whereas under a WSR designation, energy development would be incompatible. The potential for energy development within the Guano Creek corridor is very low. Motorized use within the Guano Creek corridor area is limited to existing roads and ways. There are two existing ways within the Guano Creek corridor; one parallels the stream along the upper 1.5 miles and the other parallels the stream along the last 1.0 mile. Under wilderness designation these ways would be closed to motorized use. Under the existing situation, the potential negative impacts to the vegetative out-

standingly remarkable values from motorized access is negligible.

Grazing is not authorized within the Honey Creek corridor with the exception of a water gap (a water gap allows cattle access to water for a distance of approximately 100–150 feet along the stream). There are approximately 5.6 miles of BLM-administered public land along a 17-mile stretch of Honey Creek, which starts at the Fremont National Forest boundary on the west and ends at Hart Lake in the east. This public land is interspersed with private land in a checker board pattern. Approximately 67 percent of the 17-mile segment is in private ownership. This checker board land ownership limits the ability to effectively manage stream resources, and the same would hold true if Honey Creek was proposed for designation as part of the national WSR system. Designation would not provide a significantly higher level of protection to the fisheries outstandingly remarkable values in Honey Creek than that which is already available under the “Endangered Species Act.” There is potential for energy development, but the physical suitability is unknown. Because of the rural and arid nature of the area, potential for energy development is considered low. Recreational use of the area is very low. Water levels are generally too low for boating activities, and there is minimal evidence of human use. The potential for negative impacts to the fisheries outstandingly remarkable values from recreational uses, including motorized use, is negligible.

Designation in the national WSR system would not provide a significantly higher level of protection to the fisheries outstandingly remarkable values in Twelvemile Creek above that which is already available under the “Endangered Species Act.” Recreation uses within the Twelvemile Creek area are relatively low and the effects of these activities on the fisheries outstandingly remarkable values are negligible. Impacts from motorized uses would not be significant, because access within the stream corridor is limited to three very rough, steep jeep trails (one is on private land). The potential for energy development within Twelvemile Creek is considered low because of the rural and arid nature of the area. Grazing is excluded within the Twelvemile Creek corridor by fencing.

Although the fisheries outstandingly remarkable values for both Honey and Twelvemile Creeks are currently afforded adequate protection under the “Endangered Species Act,” these protections would be diminished should the Warner sucker be removed from Federal listing.

### **Alternative B**

Guano, Honey, and Twelvemile Creeks would not be recommended administratively suitable for inclusion into the national WSR system. OHV designations for each of these streams would be the same as Alternative A. Overall, there would not be a significant increase in the potential for negative effects to the outstandingly remarkable values because of existing laws, regulations, and policies which currently apply on each of the three creeks, as described under Alternative A.

### **Alternative C**

Guano, Honey, and Twelvemile Creeks would be recommended administratively suitable for inclusion in the national WSR system. Guano Creek would be recommended suitable for potential designation by Congress with a tentative classification as wild. Honey Creek and Twelvemile Creek would be recommended suitable for potential designation by Congress with a tentative classification as scenic.

Under a wild classification, no energy development would be allowed within Guano Creek. However, potential energy development within Guano Creek is considered low. Guano Creek is also located within the Guano Creek WSA and potential development within the stream corridor would be limited based on the WSA status and the future potential congressional designation as wilderness. No new mining claims and mineral leases would be allowed within 0.25 miles of the stream. There are no mining claims or oil and gas leases located near Guano Creek, and the potential for locatable minerals is very low. Grazing is currently not authorized and would not be allowed with or without designation in the national WSR system. Recreational use within the stream corridor is low and the restrictions on the development of recreation facilities within the stream corridor under the wild classification would not be necessary. Motorized travel on land and water could be permitted under the wild classification. However, access within the stream corridor due to WSA status would be limited to designated roads and ways, and the potential for impacts from OHV use would be negligible to nonexistent. The way located at the lower stream reach near the Shirk Ranch would be closed to OHV travel. Because Guano Creek is located within the Guano Creek WSA, the vegetative outstandingly remarkable values are afforded a level of protection under wilderness IMP (USDI-BLM 1995b), which is comparable to designation within the national WSR system. Additionally, the potential designation of Guano Creek WSA by Congress as wilderness would provide a long-term level of protection.

Under a scenic classification, no energy development would be allowed on either Honey or Twelvemile Creeks. However, potential energy development within each of these creeks is considered low. Although mining claims and mineral leases would be allowed under a scenic designation, the mineral potential in each of these stream corridors is low. There are no existing mining or oil and gas leases located near these streams. The potential for negative impacts to these stream corridors from resource extraction activities would be negligible to nonexistent. Livestock grazing would continue to be excluded from both streams. Development of recreation facilities would be allowed within the stream corridors, but the recreation uses within these areas are so low that any development would not be economically feasible or practical. Access to these stream corridors is limited, and the potential negative impacts to the fisheries outstandingly remarkable values is negligible. Designation of Honey Creek and Twelvemile Creek as part of the national WSR system, with a potential classification as scenic, would not provide a significantly higher level of protection to the fisheries outstandingly remarkable values than that which is already available under the "Endangered Species Act."

### **Alternative D**

About 6.6 miles of Twelvemile Creek would be recommended administratively suitable for potential designation by Congress with a tentative classification as recreational. Honey Creek and Guano Creek would both be recommended administratively unsuitable for inclusion in the national WSR system. The impacts associated with the unsuitable recommendations for these two creeks would be the same as described under Alternative A.

Under a recreational designation, public use and access could be regulated, recreation facilities could be established within the stream corridor, forest practices would be allowed, mining could occur subject to existing regulations, rights-of-way (for transmission lines, pipelines, etc.) would be avoided or restricted to existing rights-of-way, and motorized uses would be permitted on land and water. Recreation and OHV (motorized uses) uses within the Twelvemile Creek area are relatively low and the effects of these activities on the fisheries outstandingly remarkable values are negligible. With the exception of 90 acres, all 6.6 miles (0.25 miles on either side of the stream) of Twelvemile Creek corridor is in public ownership (Map SMA-22). Acquisition of this private parcel would benefit the fisheries outstandingly remarkable values, regardless of potential designation in the

national WSR system.

The potential inclusion of Twelvemile Creek as part of the national WSR system under a recreational classification would provide an additional, although minimal, level of protection to the outstandingly remarkable values above the protections already provided under the “Endangered Species Act.” However, should the Warner sucker be removed from the “Endangered Species Act” list, the protection afforded through the Act would no longer play a key role in the protection of the fisheries outstandingly remarkable values or associated habitat. Livestock grazing would continue to be excluded from this stream, regardless of any designation by Congress. Designation as part of the national WSR system would ensure a long-term level of protection relating to the outstandingly remarkable values, regardless of any future role the “Endangered Species Act” would or would not play in protection of the fisheries. Although Twelvemile Creek was given a tentative classification as scenic under the eligibility assessment, the recreational classification would provide the needed level of protection of the outstandingly remarkable values, while allowing a greater level of flexibility in the management of the fish populations and habitat within the stream corridor. Designation of Twelvemile Creek as a recreational river within the national WSR system would have a positive, but minimal, impact on the fisheries outstandingly remarkable values.

#### **Alternative E**

None of the three eligible streams would be recommended administratively suitable for potential designation by Congress as WSR's. The impacts to the outstandingly remarkable values for each of the streams would be the same as addressed under Alternatives A and B. Guano Creek would continue to be managed under the wilderness IMP (USDI-BLM 1995b), and there would be no change in current management. Management of Twelvemile and Honey Creek corridors would continue to be driven by the management prescriptions for the Warner sucker. No VRM class would be assigned to Twelvemile and Honey Creek. Visual resources would be managed to allow natural processes to determine visual quality. Visual resources within Guano Creek would be managed under VRM Class I because of the WSA status. Overall, there would not be a significant increase in the potential for negative effects to occur because of the protections afforded by existing laws, regulations, and management policies which are currently in place: Wilderness IMP (USDI-BLM 1995b) for Guano Creek and the “Endangered Species Act” for Honey and

Twelvemile Creeks.

#### **Summary of Impacts**

Under Alternatives A, B, and E, none of the eligible streams would be recommended administratively suitable for potential designation by Congress as part of the national WSR system. Potential impacts to the outstandingly remarkable values associated with the three streams would be negligible without designation as part of the national WSR system because of the existing protections afforded them through the wilderness IMP (USDI-BLM 1995b) and the “Endangered Species Act.” Additionally, grazing is excluded from each these streams and the potential negative impacts on the outstandingly remarkable values from this activity is not an issue.

Under Alternative C, Guano Creek is proposed for designation with a tentative classification as wild, while Honey Creek and Twelvemile Creek are recommended for designation with a tentative classification as scenic. The potential protection afforded the outstandingly remarkable values through designation and inclusion in the national WSR system would be negligible in comparison to the existing situation. Designation under a wild and/or scenic classification would provide protection against the possibility for hydropower development. However, the potential for hydropower development on all three streams is considered to be low. Additionally, given the protections provided the outstandingly remarkable values through the Wilderness IMP (Guano Creek) and the “Endangered Species Act” (Honey Creek and Twelvemile Creek), designation as part of the national WSR system would provide little protection above what is currently in place.

Under Alternative D, only Twelvemile Creek would be recommended administratively suitable for possible designation by Congress at a tentative classification as recreational. The added protection of designation as a recreational river in the national WSR system would have a slightly higher potential to positively impact the outstandingly remarkable values (fisheries) in comparison to Alternatives A, B, and E, and would be comparable to Alternative C, even though the tentative classification under Alternative C would be scenic. Inclusion in the national WSR system under a tentative classification of recreational would ensure long-term protection of the fisheries outstandingly remarkable values, even if current protections under the “Endangered Species Act” would no longer be applicable. Alternative D, which provides protection of the outstandingly remarkable values under a tentative classifi-

cation of recreational, would be sufficient to meet the stated management goal for WSR's.

### **Secondary, Indirect, and Cumulative Impacts**

Past water resource related projects (i.e., reservoirs and water diversion structures) on Guano, Honey, and Twelvemile Creeks have had an impact on each stream to varying degrees. On Guano Creek, Jacob's Reservoir, which is located above the study corridor, was constructed for irrigation purposes and has had an influence on the natural stream flow. There are several small reservoirs located upstream of the study corridor on Honey Creek, as well as several small diversion structures on private lands above and below the BLM-administered stream segments. There are also several diversion structures above and below the study corridor on Twelvemile Creek. Potential negative impacts to the outstandingly remarkable values from present or future projects or actions on lands within or adjacent to the study corridors would be negligible or nonexistent because of the existing protections under current laws, regulations, and policies; e.g., the wilderness IMP (USDI-BLM 1995b) and possible ACEC designation (Guano Creek) and the "Endangered Species Act" (Honey and Twelvemile Creeks).

## **Cultural and Paleontological Resources**

**Management Goal 1—*Preserve and protect cultural resources in accordance with existing laws, regulations, and Executive orders, in consultation with Native Americans.***

**Management Goal 2—*Increase the public's knowledge of, appreciation for, and sensitivity to cultural resources, Native American issues, and paleontological resources.***

**Management Goal 3—*In consultation with local Native American Tribes, take actions, including designating areas of critical environmental concern (ACEC's) to protect traditional religious sites, landforms, burial sites, resources, and other areas of interest. Nominate as traditional cultural properties those areas that qualify.***

### **Assumptions**

Some of the actions which are described in the alternatives may have positive or beneficial impacts on cultural resources; some may have negative impacts

which would have to be mitigated, as required by Federal laws and regulations. Some impacts would be destructive and cannot be mitigated (such as the destruction of a Native American traditional cultural property).

Significant cultural resource properties and Native American traditional cultural properties may be protected by various management strategies designed to preserve such sites for future scientific research, recreational uses, educational use, or Native American use. Examples of protected significant properties are the Abert Lake National Register District within the Lake Abert ACEC. Exclosures proposed by other programs, such as wildlife and range, often protect cultural resources from cattle congregation and human vandalism. WSA and wilderness designations help restrict OHV use and protect sites.

### **Analysis of Impacts**

#### **Impacts Common to Alternatives A–D**

Impacts to cultural resources would generally be the same under all four alternatives.

The management proposed for riparian zones to improve water quality and aquatic habitat while reducing soil erosion would benefit cultural resources. Restricting livestock grazing along streams, stabilizing stream banks, and closing roads in or near riparian areas would maintain or enhance conditions of archaeological sites in these areas. Negative impacts often outweigh beneficial ones, but could be mitigated. Livestock and wild horse congregation and trampling could adversely affect cultural resources along streambanks and around springs.

The designation of SMA's, such as RNA's, ACEC's, and WSR's, generally would have a positive effect upon cultural resources and traditional cultural properties since management actions restrict detrimental uses. This would be accomplished by reduction or elimination of surface disturbances, which are often caused by activities such as OHV use, grazing, construction of range improvements, rights-of-way placement, and mineral entry. Restricting these activities would result in increased ground cover, leading to a reduction in soil erosion, which would help to maintain the integrity of cultural sites.

Prescribed fires generally would not have an impact on cultural resources. Any flammable structures that could be damaged or destroyed would be protected or avoided. Current fire management policy is to avoid

cultural sites, traditional cultural properties, and historic sites. However, in the case of wildland fire suppression, decisions must be made quickly, and occasionally there is no time to consult with a cultural resource specialist about cultural values. As a result, cultural or historic sites may be damaged or destroyed. Fires of low intensity (amount of heat) generally have little or no effect on cultural resources unless heavy equipment is used to create firelines and firebreaks. Fire severity (duration of heating) can adversely affect prehistoric sites because extreme heat can damage stone tools and lithic debris on or near the surface. Rock art can be vulnerable to both fire intensity and severity on rock types subject to spalling and in areas with high fuel loadings. Fires of any type may expose hidden sites to increased visibility and illegal collection. Prehistoric, historic, and traditional cultural properties could also be damaged by fireline construction, particularly with heavy equipment.

OHV activities, particularly if unregulated, could have a negative impact upon cultural resources and traditional cultural properties. Alternatives A, B, and D would manage large parts of the planning area in the OHV open use class. This would have the greatest impacts on cultural resources. New trails are created that cut and erode sites, scattering and breaking artifacts. The noise level and presence of people could impact the use of traditional cultural properties by Native Americans.

In addition, as OHV's take people into generally unvisited or hard-to-reach areas, the integrity of prehistoric and historic sites would be at greater risk of vandalism and collecting. Site vandalism and illegal excavation can increase in these instances. Looting of important sites is a continuing negative impact and is a criminal activity. Some people steal artifacts from public land and sell them for a profit, while others maintain private collections. Both actions impact the resource base.

When locatable minerals are mined under a plan of operation, provisions are made for inventory, evaluation, and sometimes mitigation of adverse effects to cultural resources. However, the notice of intent, which precedes a formal plan of operation, has a short timeframe, and occasionally these limited operations have adverse impacts on cultural resources. The operator would still be responsible and held accountable if the activities damaged archaeological properties. Increased mining for locatable minerals could have adverse impacts upon archaeological resources and traditional cultural properties. Locatable mining is governed by the regulations found at 43 CFR 3809.

The regulations prohibit the "undue degradation" of the environment, which might be used to prevent associated mining impacts. Another vehicle for the removal of impacts is to withdraw areas of importance from mineral entry; however, that is a difficult action, requiring secretarial or congressional approval. Salable and leasable mineral development would involve site avoidance, no-surface-occupancy stipulations, or other mitigation methods to reduce potential impacts to cultural resources (Appendix E3).

The most common, least expensive, and quickest form of mitigation of adverse effects would be to cancel, relocate, or redesign a project to avoid cultural sites. This could be easily done if the project is a fence or pipeline. On more complex projects, such as highway construction, or projects which can only be placed in one location, mitigation would be more difficult. In these cases, the adverse effects would be mitigated by scientific excavation and data collection by archaeologists. Such mitigation would always be done in consultation with Native American Tribes who have an interest.

### **Alternative E**

The removal of livestock grazing and potential for future construction of range improvement projects, mineral activity, rights-of-way, and other commercial uses would have an overall beneficial impact on cultural resources, as this would eliminate the sources of most ground-disturbing activity. Sites would not be disturbed, and artifacts would be left intact. However, the planning area would still be open to dispersed recreation and continued impacts from site vandalism and illegal artifact collecting. This would be a significant negative impact to the integrity and scientific value of the sites.

Excluding all commodity production from the planning area would also have a negative impact on the cultural resource program. Almost all survey or inventory work currently conducted on cultural resources is the result of doing cultural clearances for ground-disturbing projects. Since no new projects would be installed, there would be no need for new clearances. This source of information about cultural resources would essentially be lost.

### **Summary of Impacts**

The objectives for cultural/paleontological resources would be met under all the alternatives to varied degrees. The short-term impacts of the preferred Alternative D on cultural resources would be positive

for the cultural resource program objectives, historic property interpretation and stabilization, and for the preservation of traditional Native American uses.

The long-term impacts of the preferred Alternative D on cultural resources would be positive for all cultural resource objectives, including locating and protecting sites, increasing opportunity for public education and enjoyment of cultural and paleontological resources via site interpretation, and systematic protection of traditional Native American uses.

### ***Secondary, Indirect, and Cumulative Impacts***

Because cultural resources are location-specific, fragile, and nonrenewable, adverse impacts across the landscape (regardless of land ownership) would be cumulative. For example, if there are 500 small lithic scatters in an area and 1 or 2 per year are lost to erosion, eventually none would exist. Likewise, each episode of vandalism diminishes the educational and scientific value of an archaeological site. Over time, the history and prehistory of an area may be completely lost.

**Management Goal 4—*In order to fulfill trust responsibilities with Tribal peoples, manage public land to maintain, restore, or enhance plant community health and cultural plants. Identify traditional ecological knowledge with humans as part of the ecosystem, and maintain habitat integrity with sustainable yields at a landscape level.***

### ***Analysis of Impacts***

#### ***Alternative A***

During the NEPA analysis process for proposed land management actions, impacts to cultural plants would be considered to determine if such actions would cause a decline. Consultation with the different Tribes would be carried out concerning cultural plants and juniper woodland management. On an as-needed basis, surveys for cultural properties would be conducted in juniper woodlands.

Impacts from activities such as livestock grazing, wild horses, OHV use, rights-of-way or mineral development, and in some cases, wildland fire, would have negative impacts on the cultural plants species because of ground disturbance and potential for noxious weed invasion. Tables 2-36 and 2-37 list those plants and plant communities at risk from such actions. Impacts from vegetation treatment could have a negative effect if cultural plants are not included in the seed mixes for

rehabilitation. Since few of these plants have available seed, other species would replace them, and in the case of using crested wheatgrass plantings, it would have an extremely negative effect. However, replanting of both native and introduced plant species would curb the invasion of competing weeds.

#### ***Alternative B***

Most of the impacts would be the same as Alternative A. However, the impacts to cultural plants would be slightly higher because of the increase in livestock and wild horse AUM's, especially in areas of spring use of low sagebrush and camas meadows or riparian areas. The increase of rangeland projects would spread the livestock into larger areas than Alternative A, which would slightly increase the possibility of impacts.

The possibility of biomass energy generation plants using juniper wood would have a definite effect on the some big sagebrush and juniper woodland communities. This could impact traditional uses in some areas. Such proposals would require preparation of a separate NEPA analysis and would need consultation with Tribal people.

#### ***Alternative C***

The addition of new ACEC's and expansion of an existing ACEC specifically for management of cultural plant communities would have a significant positive effect on these resources. These ACEC's would limit ground disturbance from activities such as mining and right-of-way development and would protect many of the plant communities identified as important to Tribal people in the area.

Limiting juniper harvesting within SMA's would have a positive effect on the traditional use of this resource. The potential impacts of biomass energy generation on juniper woodlands would be similar to Alternative B. An increase of Tribal input and education within the BLM would have a positive effect for management needs and direction.

The decrease in AUM's for livestock and decreased number of range projects would have a positive effect on the plant communities. Wild horses would have the same impact as in Alternative A.

By limiting OHV use to existing or designated roads and trails (Map R-6 of the Draft RMP/EIS), the impact to cultural plants and communities would be lessened, compared to Alternatives A or B.

**Alternative D**

The impacts would be the same as Alternative C. However, the impact of the OHV open use designation would be greater than Alternative C. The impact of livestock grazing would be the same as Alternative A. The potential increase of wild horse numbers and AUM's could create an increased threat to cultural plants and communities within herd management areas.

**Alternative E**

This alternative would not designate any new ACEC's for cultural plants, and thus, would not provide extra management protection of these areas. Juniper woodlands and associated traditional uses would have increased protection with prohibition of wood and bough cutting.

**Summary of Impacts**

Alternatives A and B would generally have a negative impact on cultural plant community health. Project clearances and mitigation actions for protection of cultural plants would be done on a case-by-case basis. Consultation would continue with local Tribes. Only one new ACEC (Connley Hills) providing protection and management of cultural plants would be designated under Alternative B.

Under Alternatives C and D, impacts to plant communities and cultural plants would be much more beneficial. Eight new ACEC's would be designated, in part to protect the traditional uses and values that are important to local Tribes. Tribal people would have access to traditional resources and use areas in these eight ACEC's. Future management of these ACEC's would take these values into account.

Under Alternative E, no new ACEC's would be designated; therefore, this would preclude any special protection and management for cultural plants and traditional use areas. However, these resources would be generally protected since neither livestock grazing, mining, nor other commercial activities would be allowed. Native Americans and others would still be able to harvest cultural plants. However, these plants would have no special protection or management. Long-term impacts on their continued existence would be uncertain.

**Secondary, Indirect, and Cumulative Impacts**

Designating areas as ACEC's and prescribing special management for resources and values that are impor-

tant to local Tribes fulfills BLM trust responsibilities. This provides a means to establish better working relationships with these Tribes. Actions in Alternatives C and D provide special management for areas that, while they are still available for other uses, would support traditional uses and needs of local Tribes. Across the larger landscape, areas that have traditional importance and use are disappearing or are being changed in ways that make them no longer compatible for Tribal uses. Designating these areas would help to ensure that some areas survive unchanged for the foreseeable future.

**Human Uses and Values**

**Management Goal—*Manage public lands to provide social and economic benefits to local residents, businesses, visitors, and future generations.***

**Assumptions**

Recreation use of BLM-managed lands generates local economic activity in several ways. Visitors to the area purchase food, fuel, lodging, and other goods and services from local businesses. Some businesses cater specifically to visitors and have special recreation permits for commercial uses of BLM-managed lands. Examples include all types of guide services and wilderness therapy schools.

Current visitation to developed sites on BLM-managed land is estimated at 117,500 annually (out of an estimated total annual visitation of 155,118 visitors). Future demand for recreation opportunities is expected to increase at about 4.0 percent annually. Population increases are the primary drivers of this trend. The Oregon State Parks Department has projected annual growth rates for specific activities. Of particular concern in the Lakeview District is the projected increases in OHV use of 2.9 percent annually (Oregon State Parks and Recreation 1991). The projected demand for recreation opportunities can be met in multiple places by multiple ownerships. Future management of lands and recreation sites would determine the attractiveness of these areas for specific types of recreation uses. This would determine the distribution of recreation between regions and across ownerships.

## Analysis of Impacts

### Alternative A

**Agriculture and livestock use:** Opportunities to increase grazing use levels from the past average use level of 108,234 AUM's to the full active preference of 164,128 are retained. The ability of actual grazing use to increase to full active preference is tied to the development and implementation of economically feasible grazing systems and range improvements, and the willingness and ability of existing permittees to expand grazing operations when opportunities arise. Overall, it is anticipated that total cattle and calf sales in Lake County could be approximately \$22.7 to \$24.6 million (based on 1998 sales in the county), an increase of 9 to 17.9 percent from historic sales. The range of impacts identified represents uncertainty regarding the flexibility of permittees to expand productivity and herd sizes during seasons when livestock are not utilizing BLM-managed lands. Grazing fee collections could be approximately \$221,573 annually if the current fee remains the same for the life of the plan, an increase of \$75,457 from historic averages.

**Mineral resources:** Alternative A continues existing mineral withdrawals for about 13,400 acres. This would not change future development opportunities as discussed in Appendix N2 (reasonably foreseeable development scenarios) from the current situation. Continuation of the Public Sunstone Area would retain an important and unique recreational resource that contributes to tourism-related economic activity.

About 433,790 acres would continue to be closed to leasing. These closures affect about 10 percent of lands with high potential. Also, 101,433 acres would continue to be subject to no-surface-occupancy stipulations. These stipulations affect 11 percent of acres with high mineral potential (Table 4-6). The current management direction moderately limits opportunities for future mineral development, as discussed in Appendix N2. In the event that lands are eliminated from wilderness consideration by future congressional action, these lands would be reopened for mineral leasing unless constrained by other designations or specific closures. Necessary constraints would be implemented to protect resource values.

Alternative A continues present management of existing pits and quarries and allows for establishment of new sites in areas open to mineral material disposal. About 467,323 acres are closed to mineral material disposal. Several sites of high quality decorative stone, cinders, and dolomitic limestone are included within

the closed acreage. This alternative identifies one potential site (Devils Garden) for establishment of a common use area if that particular area is dropped from wilderness consideration by future congressional action. A high level of lands would be available for mineral materials. The current needs and anticipated future demands of both public users and county, state, and Federal agencies could be met under this alternative.

**Forest and woodland resources:** Alternative A does not declare an allowable sale quantity for the forest and woodlands within the planning area. Instead, commercial forest products would be a byproduct of management treatments designed to reduce overstocking, control competing vegetation, remove invasive juniper or white fir, reduce ground and understory ladder fuels, improve forest health, and increase resistance to insect and disease outbreaks and wildland fires.

Commercial and public wood cutting is an important existing use that would be used to address some forest and woodland treatment needs, especially in invasive juniper stands. It is unlikely the demand for commercial and public wood cutting could completely address the identified need for treatment of invasive juniper stands over the life of the plan. Alternative A meets existing and anticipated future demand for commercial and public wood cutting opportunities. Other forest and woodland treatments (culturing, cutting, mechanical, thinning, and prescribed fire) could provide employment opportunities to various contractors and seasonal employees. The extent of these employment opportunities would be dependent of future funding of forest treatment activities.

**Recreation resources:** Alternative A develops tourism opportunities. New recreation sites would be developed to meet increased recreation demand and to protect cultural and natural value and public health and safety. This would meet current and future demands and would pursue opportunities to further expand recreation use and opportunities through developments, partnerships, and increased visitor information and education.

Motorized and mechanical vehicle use would be managed under open, limited to designated or existing roads and trails, and closed designations. The Sand Dunes WSA would be designated as open, allowing significant recreational use to continue. Special recreation permits would be issued for organized events consistent with the protection of resource values. Existing and future demand for motorized vehicle use would be met under this alternative.

Special recreation permits would be issued. Existing commercial recreational uses and organized recreational activities would continue. Existing guided uses and wilderness therapy schools would be able to use BLM-managed lands. Existing tourism-related firms would continue and would have opportunities to expand in the future.

Management of the Sunstone Collection Area would be continued. Future development of a primitive camping area in the vicinity would support additional visitor use. Sunstone collection is a unique recreational opportunity. No commercial uses would be permitted in the public collection area.

**Federal agency activities:** The business activities of the Federal government would not change significantly. With appropriated funding, current program emphasis would continue to generate local economic activity through direct Federal employment, local and regional purchases and contracting, and provision of commodities and recreational opportunities. The level of government and contract employment associated with restoration activities (such as prescribed fire, noxious weed treatment, and wildfire rehabilitation) would be unchanged.

**Land tenure and revenue sharing:** This alternative would not result in significant changes in Federal ownership patterns. Future land exchanges would have no significant impacts, including impacts to Federal revenue sharing programs, due to the equalization requirements of the 1992 "Interior Appropriations Act." Payments-in-Lieu-of-Taxes would increase due to Public Law 103-397, which authorizes increased payments. Actual increases would be dependent on congressional action to fund these increases.

**Environmental justice:** Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations," requires Federal agencies make achievement of environmental justice part of its mission by identifying disproportionately high adverse human health or environmental impacts of its programs, policies, and activities on minority and low income populations. Native Americans are a minority population of concern because of historic and current uses of public lands for traditional cultural practices. No other minority of low income populations has been identified.

There would be no disproportionate, adverse impacts to low income or minority populations from this alternative. Impacts related to Native American traditional uses are discussed in the Special Management Areas

and Cultural and Paleontological Resources sections of Chapter 4.

**Conclusion:** Underlying demographic trends would dominate future population and age distribution conditions within the study area. Alternative A maintains current levels of economic uses of the public lands. This includes economic activity associated with Federal grazing use, mining activity, recreation, and restoration. Alternative A maintains the current level of economic opportunity for future development. This includes potential for growth in mining and recreation.

### **Alternative B**

**Agriculture and livestock use:** Active preference would be increased to 180,541 AUM's, 10,823 AUM's more than active preference under Alternative A. The ability of actual grazing use to increase to full active preference is tied to the development and implementation of economically feasible grazing systems and range improvements, and the willingness and ability of existing permittees to expand grazing operations when opportunities arise. Overall, it is anticipated that total cattle and calf sales in Lake County could be approximately \$23.3 to \$25.7 million (based on 1998 sales in the county). This represents an increase of 11.6 to 23.2 percent from historic sales and 2.4 to 4.5 percent relative to potential sales under Alternative A. The range of impacts identified represents uncertainty regarding the flexibility of permittees to expand productivity and herd sizes during seasons when livestock are not utilizing BLM managed lands. Grazing fee collections could increase by approximately \$90,068 from historic averages and by \$14,611 when compared to Alternative A, if the current fee remains the same for the life of the plan.

**Mineral resources:** Alternative B would open an additional 4,440 acres to mining claim location through revocation of existing withdrawals. These areas include the current Public Sunstone Area (an area of high interest) and public water reserves (areas of low interest). These changes would not measurably change future development opportunities, as discussed in Appendix N2. Revocation of the Public Sunstone Area would eliminate an important and unique recreational resource, potentially reducing tourism-related economic activity.

Alternative B would slightly increase the acreage open to mineral lease from the current situation. Approximately 18,000 acres in the Lake Abert area would be made available for leasing by removing special stipulations that currently preclude sodium development.

This is an area of high potential. Lease closures total about 415,790 acres and would affect about 36 percent of lands with high potential (Table 4-6). About 105,108 acres would be subject to no-surface-occupancy stipulations. These stipulations would affect about 52 percent of acres with high mineral potential. With the exception of greatly increased opportunity for the development of sodium leasing in the Lake Abert area, this alternative would not appreciably change future mineral leasing development opportunities, as discussed in Appendix N2.

Alternative B would continue present management of existing pits and quarries and allow for establishment of new sites in areas open to mineral material disposal. Four specific sites for possible future community use areas would be identified. About 467,323 acres would continue to be closed to mineral material disposal. Several sites of high quality decorative stone and cinders would be included within the closed acreage. Three potential sites (Devils Garden, Squaw Ridge, and Four Craters) would be identified for establishment of a common use area if those particular areas are dropped from wilderness consideration by future congressional action. A high level of lands (about 85 percent) would be available for mineral materials use. The current needs and anticipated future demands of both public users and county, state, and Federal agencies could be met under this alternative.

**Forest and woodland resources:** Alternative B would not declare an allowable sale quantity for forest and woodlands. Instead, commercial forest products would be a byproduct of management treatments designed to reduce overstocking, control competing vegetation, remove invasive juniper or white fir, reduce ground and understory ladder fuels, improve forest health, and increase resistance to insect and disease outbreaks and wildland fires.

Commercial and public wood cutting would continue to be an important existing use that would be used to address some forest and woodland treatment needs, especially in invasive juniper stands. It is unlikely the demand for commercial and public wood cutting could completely address the identified need for treatment of invasive juniper stands over the life of the plan. Existing and anticipated future demand for commercial and public wood cutting opportunities would be met. Other forest and woodland treatments (culturing, cutting, mechanical, thinning, and prescribed fire) could provide employment opportunities to various contractors and seasonal employees. The extent of these employment opportunities would be dependent on future funding of forest treatment activities.

**Recreation resources:** Alternative B would emphasize the development of tourism opportunities. New recreation sites would be developed to meet increased recreation demand and to protect cultural and natural values and public health and safety. This would meet current and future demands and would provide opportunities to further expand recreation use and opportunities through developments and promotions.

Motorized and mechanical vehicle use would be managed under open, limited to designated or existing roads and trails, and closed designations. The Sand Dunes WSA would be designated as open, allowing a significant recreational use to continue. Special recreation permits would be issued for organized events.

Special recreation permits would be issued. Existing commercial recreational uses and organized recreational activities would continue. Existing guided uses and wilderness therapy schools would be able to use BLM-managed lands. Existing tourism-related firms would continue. Existing and new firms would have opportunities to expand in the future.

The Sunstone Collection Area would be managed to encourage commercial use. Opportunities could exist to expand tourism-related businesses to include outfitting and guided tours for the collection of sunstones.

**Federal agency activities:** The business activities of the Federal government could increase slightly. With appropriated funding, program emphases would shift to generate local economic activity through increased provision of commodities and recreational opportunities. The level of government and contract employment associated with restoration activities (such as prescribed fire, noxious weed treatment, and wildfire rehabilitation) would be similar to Alternative A.

**Land tenure and revenue sharing:** Impacts would be similar to Alternative A.

**Environmental justice:** Impacts would be similar to Alternative A.

**Conclusion:** Underlying demographic trends would dominate future population and age distribution conditions. Alternative B would maintain current levels of economic uses of public lands. Several proposals to enhance visitor services and access on public lands could occur. Economic activity associated with visitors to public lands would increase. The current level of economic opportunity for future development would be maintained. This would include

potential for growth in mining, livestock use, and recreation.

### **Alternative C**

**Agriculture and livestock use:** Active preference would decrease by 77,541 AUM's to 86,587 AUM's over the life of the plan. Opportunities to expand grazing operations using federal forage would be eliminated. Total cattle and calf sales in Lake County would be approximately \$19.4 to \$20.15 million (based on 1998 sales in the county). This would represent a decrease of 3.5 to 6.9 percent from historic sales and 11.4 to 21.1 percent relative to potential sales under Alternative A. The reduction in active preference below the historic use level of 108,234 AUM's would result in marginal to modest reductions in historic herd size for affected permittees, reducing productive capacity and sales. Permittees who experience reductions or loss of Federal grazing privileges would be required to restructure their existing operations to utilize existing private resources more efficiently or acquire new resources to replace those no longer provided by public lands. Changing the season of use would also require similar restructuring of livestock operations. The range of impacts identified represents uncertainty regarding the flexibility of permittees to restructure their existing operations. Restructuring of this kind favors large, diversified agricultural operations with capital reserves or resources. Smaller, less diversified operations and operations of relatively small, privately-owned land bases would be at greater risk of foreclosure or bankruptcy. Grazing fee collections would decrease by approximately \$29,224 from historic averages and by \$104,680 when compared to Alternative A, if the current fee remains the same for the life of the plan.

**Mineral resources:** Alternative C would continue existing mineral withdrawal for 13,400 acres and close an additional 18,459 acres to mineral location. These closures would moderately reduce future development opportunities, as discussed in Appendix N2.

Alternative C would moderately decrease the acreage open to leasing from the current situation. Closures would total about 532,403 acres. These closures would affect 98 percent of the lands with high potential. About 119,460 acres would be subject to no-surface-occupancy stipulations. These stipulations would affect 1 percent of the acreage with high mineral potential (Table 4-6). This would moderately reduce future mineral development opportunities, as discussed in Appendix N2.

Alternative C would continue present management of existing pits and quarries and allow for establishment of new sites in areas open to mineral material disposal. About 600,598 acres would be closed to mineral material disposal. Several potential sites for high quality decorative stone and cinders would be included within the closed acreage. Areas dropped from wilderness consideration by future congressional action would be opened to mineral material disposal. A high level of lands (about 82 percent) would be available for mineral material use. The current needs and anticipated future demands of both public users and county, state, and Federal agencies could be met under this alternative.

**Forest and woodland resources:** Alternative C would not declare an allowable sale quantity for the forest and woodlands. Instead, commercial forest products would be a byproduct of management treatments designed to reduce overstocking, control competing vegetation, remove invasive juniper or white fir, reduce ground and understory ladder fuels, improve forest health, and increase resistance to insect and disease outbreaks and wildland fires.

Commercial and public wood cutting would continue to be an important method used to address some forest and woodland treatment needs, especially in invasive juniper stands. It is unlikely that the demand for commercial and public wood cutting could completely address the identified need for treatment of invasive juniper stands over the life of the plan. Alternative C would meet existing and anticipated future demand for commercial and public wood cutting opportunities. Other forest and woodland treatments (culturing, cutting, mechanical, thinning, and prescribed fire) could provide employment opportunities to various contractors and seasonal employees. The extent of these employment opportunities is dependent on future funding of forest treatment activities.

**Recreation resources:** Alternative C deemphasizes tourism opportunities. Minimal new recreation sites would be developed. Opportunities for recreation in primitive and remote locations would occur unless resource values were being degraded beyond acceptable levels. Specific area closures and use limitations would be proposed to protect resource values and human safety. Some current uses would no longer be allowed and future demand for developed site recreational opportunities would not be met by this alternative. This could marginally impact existing recreation-related businesses and limit future opportunities to develop new recreational related businesses.

OHV use would be managed under open, limited to designated or existing roads and trails, and closed designations. The Sand Dunes WSA would be designated as closed, precluding a significant existing recreational use. The current annual visitation of about 11,000 generates an estimated \$263,000 of visitor spending locally and throughout the region (Johnson et al. 1995). Displacement of these visitors to sites outside the north Lake County area would eliminate local spending generated by these visitors. The communities of Christmas Valley, Summer Lake, Silver Lake, and Fort Rock would be impacted. Special recreation permits would be issued for organized events, but use would be limited to designated or existing roads and trails. Some existing visitation could be shifted to other ownerships (primarily USFS) in the area and to other regions which offer greater opportunities for OHV use. Compared to Alternatives A and B, OHV restrictions (Map R-6 of the Draft RMP/EIS), along with closure of specific roads and trails (Table 4-4), would make it more difficult for the public and Tribal people to access public lands for hunting, other recreational pursuits, and traditional uses.

Issuance of special recreation permits would be limited. Existing guided uses and wilderness therapy schools would be able to use BLM-managed lands. Opportunities to develop new recreation-related businesses would be reduced compared to Alternatives A or B.

Management of the Sunstone Collection Area would continue under existing guidelines. This would retain an important and unique recreational resource that contributes to tourism-related economic activity.

**Federal agency activities:** The business activities of the Federal government could increase slightly. With appropriated funding, program emphasis would shift to generate local economic activity through direct Federal employment, local and regional purchases and contracting, improved recreational opportunities, and restoration activities. The level of government and contract employment associated with restoration activities (such as prescribed fire, noxious weed treatment, and wildfire rehabilitation) would increase and have the potential to slightly increase local employment. The extent would be dependent on future budget allocations, the extent contracts are used, and additional Federal employees hired to accomplish restoration objectives.

**Land tenure and revenue sharing:** Impacts would be similar to Alternative A.

**Environmental justice:** This alternative would

preclude collection of vegetative products for personal use within some of the proposed ACEC's and/or RNA's (see Special Management Area section and Table 3-3). This restriction would reduce opportunities for all people equally. However, Native Americans would be disproportionately adversely impacted since they are the main traditional users of these products. Cultural resource values and traditional use areas would be protected in eight ACEC's which are proposed, in part, to protect cultural values and known Native American traditional use areas. Collection of vegetative products by Native Americans would be allowed to continue in these areas. No other ethnic groups or low income populations would be disproportionately adversely impacted.

**Conclusion:** Underlying demographic trends would dominate future population and age distribution conditions. Current levels of economic uses of the public lands would be decreased. Economic activity associated with visitation on public lands could increase because of underlying population increases, but the BLM would not provide new facilities or opportunities to attract additional recreational users. The level of economic opportunity for future development would decrease due to decreased acreage available for mineral development, decreased livestock use authorizations, and limited availability of special use permits.

#### **Alternative D**

**Agricultural and livestock use:** Active preference would be unchanged from Alternative A. Alternative D would retain opportunities to increase grazing use levels up to full active preference. The ability of actual grazing use to increase to full active preference is tied to the development and implementation of economically feasible grazing systems and range improvements, and the willingness and ability of existing permittees to expand grazing operations when opportunities arise. Total cattle and calf sales in Lake County could be approximately \$22.7 to 24.6 million (based on 1998 sales in the county), an increase of 9 to 17.9 percent from historic sales. The range of impacts identified represents uncertainty regarding the flexibility of permittees to expand productivity and herd sizes during seasons when livestock are not utilizing BLM-managed lands. Grazing fee collections could be approximately \$221,573 annually if the current fee remains the same for the life of the plan, an increase of about \$75,457 from historic averages.

**Mineral resources:** Alternative D would continue existing mineral withdrawals and would close an additional 3,820 acres to mineral location (Table 3-7,

Map M-10). These closures would slightly reduce likely future development opportunities (Table 4-6), as discussed in Appendix N2.

Alternative D would slightly decrease acreage open to mineral leasing from the current situation. Leasing closures would total about 496,983 acres and affect about 91.2 percent of lands with high or moderate potential (Table 4-6; Map M-9). About 810,983 acres would be subject to no-surface-occupancy stipulations. These stipulations would affect about 53 percent of acres with high or moderate mineral potential. This alternative would not appreciably change future mineral development opportunities, as discussed in Appendix N2.

Alternative D would continue present management of existing pits and quarries and allow for establishment of new sites in areas open to mineral material disposal. About 41,658 acres of high/medium potential lands would be closed to mineral material disposal (Table 4-6; Map M-8). Several potential sites for high quality decorative stone and cinders would be included within the closed acreage. Areas dropped from wilderness consideration by future congressional action would be opened to mineral material disposal on a case-by-case basis. A high level of lands (about 61 percent) would be available for mineral material use. The current needs and anticipated future demands of both public users and county, state, and Federal agencies could be met under this alternative.

**Forest and woodland resources:** Alternative D would not declare an allowable sale quantity for forest and woodlands. Instead, commercial forest products would be a byproduct of management treatments designed to reduce overstocking, control competing vegetation, remove invasive juniper or white fir, reduce ground and understory ladder fuels, improve forest health, and increase resistance to insect and disease outbreaks and wildland fires.

Commercial and public wood cutting would continue to be an important method used to address some forest and woodland treatment needs, especially in invasive juniper stands. It is unlikely that the demand for commercial and public wood cutting could completely address the identified need for treatment of invasive juniper stands over the life of the plan. Alternative D would meet existing and anticipated future demand for commercial and public wood cutting opportunities. Other forest and woodland treatments (culturing, cutting, mechanical, thinning, and prescribed fire) could provide employment opportunities to various contractors and seasonal employees. The extent of

these employment opportunities would be dependent on future funding for forest treatment activities.

**Recreation resources:** Alternative D would develop tourism opportunities when consistent with other resource objectives. New recreation sites would be developed to meet increased recreation demand and to protect cultural and natural values and public health and safety. Alternative D would develop tourism opportunities when consistent with other resource objectives. This alternative would meet current and future demands, but would not pursue opportunities to further expand recreation use and opportunities through developments or promotions.

Motorized and mechanical vehicle use would be managed under open, limited to designated or existing roads and trails, and closed designations. The Sand Dunes WSA would be designated as open, allowing significant recreational use to continue. Special recreation permits would be issued for organized events under this alternative, but use would be limited to designated or existing roads and trails. Some existing visitation may be shifted to other ownerships (primarily USFS) in the area and to other regions which offer greater opportunities for use in areas designated as open.

Special recreation permits would be issued under this alternative. Existing commercial recreational uses and organized recreational activities would continue. Existing guided uses and wilderness therapy schools would be able to use BLM-managed lands. Existing tourism-related firms would continue and have opportunities to expand in the future under this alternative.

Compared to Alternatives A and B, OHV restrictions (Map R-7), along with closure of specific roads and trails (Table 4-4), would make it more difficult for the public and Tribal people to access public lands for hunting, other recreational pursuits, and traditional uses. This impact would be less than Alternatives C or E.

Management of the Sunstone Collection Area would continue under existing guidelines. Future development of a primitive camping area in the vicinity would support additional visitor use in the area. Sunstone collection is a unique recreational opportunity within the planning area. This would retain an important and unique recreational resource that contributes to tourism-related economic activity.

**Federal agency activities:** The business activities of the Federal government could increase slightly. With

appropriated funding, program emphasis would shift to generate local economic activity through direct Federal employment, local and regional purchases and contracting, improved recreational opportunities, and restoration activities. The level of government and contract employment associated with restoration activities (such as prescribed fire, noxious weed treatment, and wildfire rehabilitation) would increase and have the potential to slightly increase local employment. The extent would be dependent on future budget allocations, the extent that contracts are used, and additional Federal employees hired to accomplish restoration objectives.

**Land tenure and revenue sharing:** Impacts would be similar to Alternative A.

**Environmental justice:** The impacts to low income or minority populations would be similar to Alternative C.

**Conclusion:** Underlying demographic trends would dominate future population and age distribution conditions. Current levels of economic uses of the public lands would be maintained. This alternative includes several proposals to enhance visitor services and access on public lands. Economic activity associated with visitation of public lands would increase. The level of economic opportunity for future mineral development would decrease compared to Alternatives A or B, but would be higher than Alternatives C or E. Future opportunities for development of other commodity uses and recreation opportunities would be similar to Alternative A.

#### **Alternative E**

**Agricultural and livestock use:** Alternative E would result in elimination of all active preference within the planning area. Total cattle and calf sales in Lake County could be approximately \$13.6 to \$17.3 million (based on 1998 sales in the county). This would be a reduction of 17.3 to 34.7 percent from historic levels and approximately 24.1 to 44.6 percent less than potential sales under Alternative A. This would result in modest to significant reductions in herd size for affected permittees, reducing productive capacity and sales. Permittees who experience loss of Federal grazing privileges would be required to restructure their existing operations to utilize existing private resources more efficiently or acquire new resources to replace those no longer provided by public lands. Grazing operators could also choose to use private resources more intensively. The range of impacts identified represents uncertainty regarding the flexibility of permittees to restructure their existing operations. Restructuring of this kind would favor large, diversi-

fied agricultural operations with capital reserves or resources. Smaller, less diversified operations and operations on relatively small privately-owned land bases would be at greater risk of foreclosure or bankruptcy. Annual historic grazing fee collections of \$146,116 would be foregone.

**Mineral resources:** Alternative E would withdraw the entire planning area from mineral location, precluding any future development. Existing mineral claims and developments would continue as valid existing rights.

The entire planning area would be closed to mineral leasing, precluding future development of leasable mineral resources. Existing mineral leases would continue as valid existing rights.

Existing pits and quarries would be closed. The entire planning area would be closed to mineral material disposal, except where required by law or where essential for critical road construction and emergencies to protect human safety. Current needs and anticipated future demands of both public users and county, state, and Federal agencies would not be met under this alternative. In particular, state and county agencies that receive material site rights-of-way and free use permits would face difficulty finding the mineral materials needed to build and maintain public roads. In addition, these agencies would face much higher costs when obtaining these materials from private sources. Mineral material site rights-of-way and free use permits would still be available on USFS and other Federal agency lands.

**Forest and woodland resources:** Alternative E would preclude all forest and woodland treatments, and thus, any auxiliary commercial products. Alternative E would not meet existing or anticipated future demand for commercial and public wood cutting. Forest and woodland treatment activities would not provide employment opportunities in the future.

**Recreation resources:** Alternative E would deemphasize tourism opportunities. No new recreation sites would be developed to provide visitor services. Existing sites would be closed or rehabilitated. Opportunities for recreation in primitive and remote locations would occur unless resource values were being degraded beyond acceptable levels. Area closures would be the primary management response when necessary to protect resource values and human safety. Current and future demand for developed site recreational opportunities would not be met by this alternative.

The entire planning area would be limited to existing

roads and trails, except for 19,996 acres including the Sand Dunes WSA, which would be designated as closed, and 66,460 acres of deer winter range, which would be limited to designated roads and trails. The economic impacts to the north Lake County area from closing the Sand Dunes to OHV use would be similar to Alternative C. No special recreation permits would be issued for organized events. This alternative would not provide for existing levels and types of use and would not meet anticipated future demands for OHV use. Some existing visitation would be shifted to other ownerships (primarily USFS) in the area and to other regions which offer greater opportunities.

Special recreation permits would not be issued. This would preclude commercial recreational uses and organized recreational activities. Existing guided uses and wilderness therapy schools would be unable to use BLM-managed lands, negatively impacting existing recreation related firms.

Public use of the Sunstone Collection Area would be limited to surface collection. No commercial uses would be permitted. Revocation of the Public Sunstone Area would eliminate an important and unique recreational resource, potentially reducing tourism-related economic activity.

**Federal agency activities:** The business activities of the Federal government could decrease significantly. With appropriated funding, program emphasis would shift to resource protection and enforcement. Local economic activity through direct Federal employment, local and regional purchases and contracting, recreational opportunities, and restoration activities would be reduced. Federal lands would no longer provide commodities for uses that generate economic activity. Mining, grazing, and special recreation permits would be curtailed. The level of government and contract employment associated with vegetation treatment activities would be limited to those necessary to protect human health and safety.

**Land tenure and revenue sharing:** Impacts would be similar to Alternative A.

**Environmental justice:** Impacts would be similar to Alternative A.

**Conclusion:** Alternative E, which would trigger employment losses and reduce opportunities for future economic growth associated with Federal land commodities, could intensify pressures contributing to out-migration from the area.

Opportunities for employment associated with restoration activities would be reduced because of allowing natural processes to determine the rate of ecosystem improvement.

Opportunities for developed recreation and OHV use would be decreased. Underlying growth trends for visitor use would continue. However, management actions would not be responsive to this demand. OHV designations would significantly reduce the amount and quality of opportunities for OHV use. Users would be displaced to other areas of the state or to other ownerships, such as USFS lands. Some users would no longer participate in the activity due to longer travel times to suitable sites.

Existing levels of mining activity on public lands would continue due to valid existing rights associated with existing mineral leases and mining claims. Future energy and mineral development opportunities would be precluded by closure of the remaining acres to mineral leasing, location, and disposal. Opportunities for energy and mineral development would remain on other lands in the area.

### **Summary of Impacts**

Under Alternatives A–D, underlying demographic, regional, and national economic trends would be the primary determinants of economic activity in the future. Alternative E would disrupt existing uses on public lands and preclude future development of mineral resources. This would reduce existing levels of economic activity and negatively impact future economic growth.

Recreation growth is expected to continue. The BLM would continue to provide developed and dispersed recreational opportunities on its lands under Alternatives A–D. Alternative B particularly emphasizes economic activities on public lands through the increased emphasis on special use permits and recreational site development. The future economic impact of recreation would be highly dependent on the ability of local businesses to provide the goods and services demanded by existing and additional visitors. Alternative E would not address the existing or future recreational demand.

The impacts to the livestock sector of the economy would vary by alternative. Alternatives A and D would continue to provide existing levels of forage. No changes in economic activity would be anticipated. Alternative B would slightly expand potential livestock use. This would create additional potential economic

opportunities for affected permittees. Alternative C would negatively affect the livestock sector by reducing forage availability. Impacts would be moderate overall with some permittees experiencing significant reductions. Alternative E would eliminate all grazing of BLM lands. Impacts would be severe overall.

None of the alternatives would impact existing levels of mineral activity, because existing mineral claims and leases are unaffected. However, the alternatives would impact the potential for future development and associated economic activity. Alternatives C and E would severely reduce or eliminate the potential for future development through closure and withdrawal of lands to leasing, location, and disposal. Alternative B would provide the greatest opportunity for future mineral development. Alternative D would have a moderate impact on future mineral development through closures and no-surface-occupancy stipulations on lands with high potential. Alternative A would continue the present situation.

### **Secondary, Indirect, and Cumulative Impacts**

Anticipated recreational growth would increase the demand for recreation across all ownerships. Alternatives which close lands to OHV use or close developed facilities would cause recreational use to be shifted to other ownerships, in particular to lands managed by the USFS. Opportunities would exist for private sector business growth to meet the increasing demand for recreational opportunities, especially for developed sites such as campgrounds.

Reduced livestock AUM's in Alternatives C and E would place additional grazing pressure on private lands and/or increase the demand for hay and other forage alternatives. Other public lands, in particular the USFS, would not be expected to increase grazing use as a result of increased demand for alternative forage.

The LRA is not a major contributor to economic activity in the lumber and wood products sector. None of the alternatives would change this. In the future, increased juniper utilization, including biomass energy generation, could reduce the costs and increase the feasibility of certain landscape treatments proposed under Alternatives A–D.

## **Air Quality**

**Management Goal**—*Meet the national ambient air quality standards as described in the “Clean Air Act” (CAA) and follow the direction and requirements of the Southcentral Oregon Fire Management Partnership.*

### **Assumptions**

- The national ambient air quality standards and the State “Oregon Smoke Management Plan” would not become more stringent.
- The maximum number of acres of prescribed fire would be ignited for each alternative over a 10-year span.
- The acres of potential wildland fire would be the same as stated in the Fire Management impact section.
- The amount of particulate matter and direction of smoke dispersion can be managed in prescribed fire but not in wildland fire.

### **Analysis of Impacts**

#### **Alternative A**

Between 5,000–7,500 tons of particulate matter could be put into the atmosphere over a 10-year period from wildland fire. Another 10,000 tons of particulate matter could be produced by prescribed fire.

#### **Alternative B**

Between 6,250–8,750 tons of particulate matter could be put into the atmosphere over a 10-year period from wildland fire. Another 16,000 tons of particulate matter could be produced by prescribed fire.

#### **Alternative C**

Between 7,500–15,000 tons of particulate matter could be put into the atmosphere over a 10-year period from wildland fire. Another 32,000 tons of particulate matter could be produced by prescribed fire.

#### **Alternative D**

Between 7,500–15,000 tons of particulate matter could be put into the atmosphere over a 10-year period from

wildland fire. Another 24,000 tons of particulate matter could be produced by prescribed fire.

### Alternative E

Between 10,000–20,000 tons of particulate matter could be put into the atmosphere over a 10-year period from wildland fire. No prescribed fire would be done.

### Summary of Impacts

All alternatives would emit varying amounts of particulate matter, but because of the ability to manage emissions in prescribed fire, the air quality goal should be met in Alternatives A–D. Wildland fire is a random event. The alternatives with larger amounts of particulate emissions (Alternatives C–E) have the potential to exceed the air quality management goal. Due to the relative isolation of the planning area and the predominant wind patterns for smoke dispersion, the probability of degrading the airshed would be low.

### Secondary, Indirect, and Cumulative Impacts

Smoke from prescribed or wildland fires burning simultaneously on the adjacent national forests—Modoc, Fremont, Winema, Deschutes—and adjacent BLM districts—Alturas Field Office, Surprise Field Office, Burns District, and Prineville Districts—and on private and state lands could have a significant impact on the air quality of southcentral Oregon. Prevailing winds in the area are south and southwesterly. As a result, multiple fires could degrade air quality in north Lake County and the Bend, LaPine, Prineville, and Burns areas. It is not likely that several prescribed fires would occur at the same time, since burn plans are coordinated with other BLM, USFS and Oregon Department of Forestry (ODF) offices. However, large wildland fires or escaped prescribed fires could occur at one time, resulting in significant air quality degradation.

## Fire Management

**Management Goal 1—*Provide an appropriate management response on all wildland fires with emphasis on firefighter and public safety. When assigning priorities, decisions would be based on relative values to be protected commensurate with fire management costs.***

### Assumptions

- The most efficient level of fire suppression resources (people and equipment) would be funded over the time period assessed. The “acres burned” assumptions are from the latest initial attack analyzer calculations.
- Human life (firefighter and public safety) would be the highest priority during a wildland fire. Once firefighters have been assigned to a fire, their safety would become the highest value to be protected. Property, natural, and cultural resources would be secondary priorities.

### Analysis of Impacts

#### Alternatives A and B

Firefighter and public safety would be maximized because of the ability to attack fires when they are small and to use direct tactics. The time spent on individual fires would be reduced, minimizing human exposure and fatigue. Aerial resources (planes and helicopters) would not be utilized as often or for as long a duration. The percentage of large fires would be smaller and public exposure would be minimized. Large fire costs and resource damage would be smallest of the alternatives. Potentially, 100,000–150,000 acres could be burned by wildland fire over a 10-year period in Alternative A, and 125,000–175,000 acres in Alternative B.

#### Alternatives C, D, and E

Firefighter safety could be compromised due to the larger size of fires by the time action is taken. Public safety would be compromised due to larger fires burning unchecked. Large fires would take longer to extinguish, which would lead to more exposure time for firefighters. More aerial resources would be used and for longer durations. A higher percentage of fire starts would become large incidents. Total fire costs and resource damages would be much higher. About 150,000–300,000 acres could be burned by wildland fire over a 10-year period in Alternatives C and D, and 200,000–400,000 acres in Alternative E.

**Management Goal 2—*Rehabilitate burned areas to mitigate the adverse effects of wildland fire on soil and vegetation in a cost-effective manner and to minimize the possibility of wildland fire occurrences or invasion of weeds.***

## ***Analysis of Impacts***

### ***Alternative A***

This alternative would be one of the most cost-effective over the short term. Rehabilitation would be on an as-needed basis, and the acres burned would be the smallest.

### ***Alternative B***

More acres would require rehabilitation than Alternative A. All wildland fires would be rehabilitated with an emphasis on forage production. In the long term, rehabilitation would benefit upland vegetation, wildlife habitats, and soil and watershed conditions by improving ground cover.

### ***Alternatives C and D***

The costs would be higher in these alternatives due to the amount of acreage burned. The acres of ground disturbed would also allow for increased risk of weed invasion. The conversion to a short fire regime would allow for more wildland fire occurrence.

### ***Alternative E***

No active rehabilitation would occur. Any rehabilitation of wildland fire areas would be the result of natural processes.

**Management Goal 3—*Restore and maintain ecosystems consistent with land uses and historic fire regimes through wildland fire use, prescribed fire, and other methods. Reduce areas of high fuel loading resulting from years of fire suppression that may contribute to extreme fire behavior.***

### ***Assumptions***

- The funding levels for prescribed fire would be sufficient to treat the target acres.
- Air quality regulations would not become so stringent as to hamper the use of fire as a management tool.
- The number of qualified people available would be sufficient to carry out the program.
- For Alternatives A–D, “treated acres” refers to the

acres analyzed in a NEPA document. It does not assume that 100 percent of those acres would be burned by fire. When applying fire, the intent would be to burn approximately 40–70 percent of the area and keep 30–60 percent unburned. A goal of landscape-level treatments would be to create a mosaic of burned and unburned areas within a larger treatment area. The range of treated acres listed in the alternatives are for impact analysis purposes, not targets. For Alternatives C and D, wildland fire use could cause the number of treated acres to vary widely from year to year, and in some years could treat a very large number of acres. (Lightning-caused fires in excess of 100,000 acres have occurred periodically in the rangeland fuels in the planning area.)

## ***Analysis of Impacts***

### ***Alternative A***

The number of acres that would be converted to a historic fire regime, and the reduction of high fuel loadings would be relatively small. The option to manage wildland fires in the Fort Rock Fire Management Area would still be available. This option would have the potential to save thousands of dollars annually in fire suppression costs.

### ***Alternative B***

The number of acres that would be converted to a historic fire regime and the reduction of high fuel loadings would be larger than Alternative A. The areas that may need the most treatment to reach the management goal may not be the same acres that would be treated for forage and commodity production. The option to manage wildland fires in the Fort Rock Fire Management Area would not be available. This could cost thousands of dollars annually in fire suppression costs and tie up firefighting resources that could be available for higher priority fires.

### ***Alternatives C and D***

These alternatives would treat the most acres to meet the stated management goal. Areas designated for wildland fire use would have to have easily defendable boundaries. Prescribed fire would be the preferred method of restoration, but would not be nearly as cost-effective as wildland fire use. With the large amount of burned acres, the potential for an escaped fire increases, as does the potential for noxious weed or cheatgrass establishment following a fire.

**Alternative E**

This alternative would slowly meet the management goal for restoring historic fire regimes, unless nonnative, short-interval species become established. The reduction of high fuel loadings would be a random event, and the resulting high intensity fire behavior would most probably change the historic fire regime.

**Summary of Impacts**

Alternatives A and B provide the highest safety for firefighters and the public, and the costs of firefighting and fire rehabilitation are the lowest (with Alternative A lower than Alternative B because of the Fort Rock Fire Management Area). The availability of burned area is the smallest for the invasion of weeds. The restoration of fire regimes and reduction of fuel loading would take longer.

Alternatives C, D, and E rate lower over the life of the plan for firefighter and public safety. This could change as fire regimes and fuel loadings are changed. The costs for suppression and rehabilitation would increase over the over the life of the plan as more acres would be burned. The chances for escape of prescribed and wildland fire use would increase. The air quality could be impacted due to the large volume of burning. Alternatives C and D would restore the historic fire regime sooner with the availability of prescribed fire. The randomness and variability of fire occurrence in Alternative E would hamper ecosystem restoration, and the lack of rehabilitation could lead to the dominance of nonnative, short-interval species.

**Secondary, Indirect, and Cumulative Impacts**

Increased use of prescribed fire and wildland fire use would ultimately result in smaller and fewer wildland fires due to reduced fuel loadings. Fire severity and intensity would also be reduced. These actions would also begin to include fire as part of natural ecosystem processes and result in more natural potential vegetation groups across the landscape. Since prescribed fires and wildland fire use would also be occurring on the adjacent Fremont National Forests, Hart Mountain and Sheldon National Wildlife Refuges, and adjacent BLM districts, a more natural form of wildland fire in the ecosystem would begin to occur, not just in the planning area, but over several million acres in south-east Oregon.

**Recreation Resources**

**Management Goal—*Provide and enhance developed and undeveloped recreation opportunities, while protecting resources, to manage the increasing demand for resource-dependent recreation activities.***

**Analysis of Impacts****Alternative A**

Management actions aimed at protecting, restoring, or enhancing watershed functions, forest health, riparian/wetland areas, upland vegetative communities, biodiversity, wildlife habitats and wildlife populations would not create significant effects on recreation. In some instances, recreation may benefit from these actions by increasing aesthetic values and through increased fish and wildlife populations providing opportunities for wildlife viewing and enhancing sport fishing and hunting.

Recreation could be negatively impacted from management actions relating to the maintenance, restoration, and protection of populations and habitats for special status plant and animal species. The degree of the effects on recreation would be dependent on the intensity of the actions. In particular, management actions initiated for the protection of greater sage-grouse and their habitat, could potentially have negative effects on dispersed recreation because of future area or road closures. Hunting would be the recreation activity with the greatest potential to be negatively impacted. Habitat important to the various life stages of the greater sage-grouse are known to occur over most of the planning area.

Actions initiated to protect cultural resources would have minimal negative impacts on recreation. Any restrictions, such as area or road closures, would typically be on a site-specific basis. Opportunities for interpretation and permitted commercial tours may exist, which would positively affect recreation. Potential resource degradation could be mitigated through interpretation and public education creating greater awareness and appreciation for these resources.

Wilderness therapy schools could create conflicts with other public lands users, ranchers, and residents, and could damage roads on a seasonal basis. Hunters would be the primary recreation user group negatively impacted. However, the impacts would be confined to localized areas where the groups are authorized to camp. The overall negative effects on hunters would

not be significant. In north Lake County, wilderness therapy schools are authorized to utilize 29 campsites within an area covering approximately 230 square miles east of Fredericks Butte Road. Given established group size limitations and limits on the number of groups authorized to operate within this area, the maximum number of campsites used at any one time would be five. There have been conflicts between ranchers/residents living in the area where three wilderness therapy companies have conducted operations in the past. Runaway students have been the focal point of concern. To reduce the potential for future conflicts relating to runaway students, there have been a number of permit stipulations initiated. When possible, wilderness therapy groups have been moved at least 5 miles from any year-round residents/ranches, there must be a minimum of one staff member for each three students, and a runaway protocol has been initiated to notify ranchers/residents of runaways.

Management actions relating to the development of mineral materials, oil, gas, and geothermal leasing, and locatable minerals would have minimal effects on recreation. Land acquisitions and the issuance of rights-of-way, leases, and permits would not cause significant negative effects on recreation.

Restricting vehicle access in the mule deer winter range in north Lake County (Map R-2 of the Draft RMP/EIS) would have minimal negative effects on dispersed recreation, and could provide greater opportunities of solitude for hikers and cross-country skiers during periods of adequate snow. Area or road closures would have minimal negative effects on dispersed recreation because they would typically occur on a limited site-specific basis. During periods when roads are wet (fall, winter, and early spring), there is a potential for resource impacts to occur.

### **Alternative B**

Actions to protect, restore, or enhance watershed functions, riparian/wetland areas, upland vegetative communities, and wildlife habitats and populations would not increase significantly compared to Alternative A. Overall, these actions would improve aesthetic values while increasing fish and wildlife populations, providing opportunities for wildlife viewing and enhancing sport fishing and hunting. Negative effects to recreation based on actions to improve forest health and biodiversity could increase slightly compared to Alternative A because the size and number of juniper stand treatments would be maximized. However, these impacts would typically be short term and site-specific during periods of rehabilitation and revegetation.

Impacts associated with management actions which are aimed at maintaining, restoring, and enhancing wildlife and wildlife habitats would be similar to Alternative A. Improving habitats for game and nongame animals would have a positive impact on recreation by increasing wildlife viewing opportunities, as well as providing for quality sport hunting opportunities. Protection and improvement of fish habitats would continue to enhance sport fishing opportunities.

Actions relating to the maintenance, restoration, and protection of populations and habitats for special status plant and animal species would be similar to Alternative A. The negative effects on recreation would be minimal. Management actions to protect greater sage-grouse and their habitat could have a negative impact on motorized and nonmotorized recreation because of future area and road closures. The significance of the impacts would be dependent on the degree or level of the restrictions imposed through specific management actions.

The designation of one new ACEC/RNA (Connley Hills) could negatively affect localized dispersed recreation activities in the area through restrictions on activities such as camping, firewood gathering, and road closures.

Impacts to recreation relating to the protection of cultural resources would be similar to Alternative A. Access to cultural sites for interpretation and educational purposes would be given greater emphasis compared to Alternative A. There could be a corresponding increase in the positive effects on tourism.

The total number of authorized user days for wilderness therapy operations would be 16,400, a decrease of 200 user days compared to Alternative A. Of this total, 8,300 user days would be available for use within north Lake County and the remainder (8,100) would be available for use in other areas. The total number of groups authorized to operate at any one time in north Lake County (five groups) would not change. The number of authorized campsites in north Lake County would not vary appreciably from the number currently authorized (29). Given the proposed use levels and group limitations, the level and type of potential impacts associated with wilderness therapy operations would be similar to Alternative A.

Impacts to recreation relating to the development of mineral materials, oil, gas, and geothermal leasing, and locatable minerals would be similar to Alternative A, except for recreational sunstone collecting. Revoking the mineral segregation and allow mining claim

location on the Public Sunstone Area would create significant negative impacts to recreational rockhounds. Impacts from issuing new rights-of-way, leases, and permits would be similar to Alternative A. Greater emphasis on acquisition of lands with high recreational values would enhance recreation opportunities compared to Alternative A.

The impacts of the mule deer winter range closure in north Lake County would be similar to Alternative A. Management actions could include restricting recreational access via area or road closures (Map R-5 of the Draft RMP/EIS/Table 4-4) on a case-by-case basis. The impacts on nonmotorized and motorized recreation activities would be similar to Alternative A.

### **Alternative C**

Impacts on recreation relating to actions to protect, restore, or enhance watershed functions, riparian/wetland areas, upland vegetative communities, and wildlife habitats and populations would be similar to Alternatives A and B. Negative effects to recreation based on actions to improve forest health and biodiversity would be lower in comparison to Alternative B (only 50 percent of the invasive juniper stands would be treated under Alternative C, whereas 75 percent would be treated under Alternative B, and commercial and public wood cutting would be maximized). However, impacts would typically be short term and site-specific during periods of rehabilitation and revegetation.

Impacts associated with management actions aimed at maintaining, restoring, and enhancing wildlife and wildlife habitats would be similar to Alternatives A and B. Impacts of management actions proposed the protection and improvement of fish habitats would continue to enhance sport fishing opportunities, as under Alternatives A and B.

Actions relating to the maintenance, restoration, and protection of populations and habitats for special status plant and animals would be similar to Alternative A or B. Actions initiated to protect greater sage-grouse and crucial habitat would be greater than Alternatives A and B and would be dependent on the degree or level of the restrictions imposed.

Management of existing and proposed SMA's (e.g., ACEC's) would impact recreational opportunities. Overnight camping would not be allowed in the Lost Forest/Sand Dunes/Fossil Lake ACEC (35,566 acres), Juniper Mountain ACEC (6,334 acres), Black Hills ACEC (3,048 acres), Connley Hills ACEC (3,675

acres), and Table Rock ACEC (5,073 acres). Additionally, the Lost Forest/Sand Dunes/Fossil Lake ACEC would be closed to OHV use. The restrictions within the Lost Forest/Sand Dunes/Fossil Lake ACEC would have the greatest negative effect on motorized recreation uses. This area has traditionally received the highest concentration of OHV use in the planning area (primarily in the sand dunes within the Sand Dunes WSA). The camping restrictions within the Juniper Mountain, Black Hills, Connley Hills, and Table Rock ACEC's would not have a significant negative effect on recreation because overnight camping opportunities would continue adjacent to the boundaries of the ACEC's. Hunters would be the user group most impacted, because historically-used primitive hunting camps would no longer be accessible. The overall negative effects on recreation would be greater than under Alternatives A and B because of these restrictions, especially in relation to the Lost Forest/Sand Dunes/Fossil Lake ACEC.

Impacts to recreation relating to actions for the protection of cultural resources would be similar to Alternatives A and B.

The total number of authorized user days (10,200) for wilderness therapy school operations would be 6,400 less than under Alternative A, and 6,200 less than under Alternative B. Of the total available user days, 4,800 user days would be authorized within the North Lake Special Recreation Management Area (a decrease of 3,500 user days within this area compared to Alternative B). There would be 5,400 user days available for the remainder of the planning area (a decrease of 2,700 compared to Alternative B). Under Alternative A, the total number of user days (16,600) were not split between North Lake Special Recreation Management Area and the remainder of the planning area. Considering group number and size limitations, upwards of 13,500 user days could be utilized in North Lake Special Recreation Management Area under Alternative A, whereas under Alternative C, approximately 8,700 could be utilized. Only four groups would be authorized to operate within North Lake Special Recreation Management Area at any one time, one less than would be allowed under Alternatives A and B. The number of authorized campsites would be similar to Alternatives A and B. Negative impacts to other user groups within the North Lake Special Recreation Management Area would be significantly less than under Alternatives A and B. The level of potential negative impacts to other user groups from wilderness therapy operations in the remainder of the planning area would be higher under Alternatives A and B because of the higher number of available user days.

Because of the seasonal use limitations within the North Lake Special Recreation Management Area, the potential for damage to roads would be significantly less than Alternatives A and B. There would be a higher potential for negative impacts to roads in the remainder of the planning area because there would be no seasonal limitation on wilderness therapy school operations.

Approximately 35,300 acres would be added to the Cabin Lake/Silver Lake Deer Winter Range Cooperative Seasonal Vehicle Closure area located in north Lake County (Map R-6 of the Draft RMP/EIS). The dispersed recreation activities, such as hiking and cross-country skiing, would be enhanced with increased opportunities for solitude. Vehicle travel would be restricted to existing and designated roads and trails within most of the planning area (Map R-6 of the Draft RMP/EIS). Several areas would be closed to OHV use. A number of roads would be closed within SMA's (Table 4-4). These restrictions would have both negative and positive effects on dispersed recreation activities. Public and Tribal access would be restricted for motorized recreation and other activities, but nonmotorized recreationists would have a greater opportunity to experience solitude. There would be greater negative effects on recreation compared to either Alternatives A, B, or D.

Development of mineral materials, oil, gas, and geothermal leasing, and locatable minerals would be restricted to varying degrees within existing and proposed SMA's, resulting in slightly lower negative effects to recreation in comparison to Alternatives A and B. The mineral segregation on the Public Sunstone Area would be retained, which would allow public recreational collection of sunstones to continue similar to Alternative A.

The issuance of rights-of-way, leases, and permits would have similar impacts as Alternatives A and B. Similar to Alternative B, recreation opportunities would be enhanced with an emphasis on the acquisition of lands with a high public value.

#### **Alternative D**

Impacts on recreation relating to actions to protect, restore, or enhance watershed functions, riparian/wetland areas, upland vegetative communities, wildlife habitats and populations would be similar to Alternatives A, B, and C. Negative effects to recreation from actions to improve forest health and biodiversity would be lower in comparison to Alternative B but similar to Alternative C. Impacts would typically be short term

and site-specific during periods of rehabilitation and revegetation.

Impacts associated with management actions to maintain, restore, and enhance wildlife and wildlife habitats would be similar to Alternatives A, B, and C. Management actions for the protection and improvement of fish habitats would continue to enhance sport fishing opportunities, similar to Alternatives A, B, and C.

Actions relating to the maintenance, restoration, and protection of populations and habitats for special status plant and animal species would be similar to Alternatives A, B, and C. The significance of any actions would be dependent on the intensity and duration of the proposed actions.

Management of existing and proposed SMA's (e.g., ACEC's) would impact recreational opportunities. No overnight camping would be allowed in the Black Hills ACEC (3,048 acres). Camping adjacent to the sand dunes (located within the Sand Dunes WSA) would be limited to three designated areas (Map SMA-9), with camping at one of the three areas closed on a rotational basis. Impacts to recreation activities, and in particular motorized recreational uses, would be significantly lower when compared to the Sand Dunes area under Alternative C, but similar to Alternatives A and B, other than the inconvenience of not being able to camp in traditionally-used areas adjacent to the open sand dunes.

Impacts relating to actions to protect cultural resources would be similar to Alternatives A, B, and C.

The total number of authorized user days for wilderness therapy school operations would be 12,800. This would be 3,800 less than Alternative A, 3,600 less than Alternative B, and 600 more than Alternative C. Of the total (12,800) available user days, 7,400 user days would be authorized within the North Lake Special Recreation Management Area (an increase of 2,300 user days over Alternative C, a decrease of 900 user days in comparison to Alternative B, and a decrease of 6,400 user days in comparison to Alternative A). There would be 5,400 user days available for the remainder of the planning area (the same as Alternative C and 2,700 less than Alternative B). The number of groups authorized to operate at any one time in the North Lake Special Recreation Management Area would be the same as Alternative C, which is two less than Alternative B, and one less than Alternative A. No more than three groups would be authorized to operate in the remainder of the planning area at any one time. Negative impacts to other user groups within the North Lake

Special Recreation Management Area would be less than Alternatives A and B and slightly higher than Alternative C. The level of potential impacts to other user groups in the remainder of the planning area would be the same as Alternative C and less than Alternatives A or B. The potential for damage to roads is higher than Alternative C (due to a lack of seasonal restriction on operations in the North Lake Special Recreation Management Area). Compared to Alternatives A and B, the potential for negative impacts to roads is slightly lower because of the lower number of groups authorized to operate at any one time and the lower number of authorized user days. The proposed number of user days would not negatively impact currently-authorized wilderness therapy schools operating in the planning area and portions of the Burns and Prineville Districts. These companies would continue to have the opportunity to increase their number of clients and operating areas through the permitting process.

The effects from the development of mineral materials, oil, gas, and geothermal leasing, and locatable minerals would be similar to Alternatives A and B, but slightly higher than Alternative C (which restricts mineral development). The mineral segregation on the Public Sunstone Area would be retained. There would be no negative effects on recreational collection of sunstone, as is the case under Alternative B. The impacts from issuing of rights-of-way, leases, and permits would be similar to Alternatives A, B, and C.

Approximately 35,300 acres would be added to the Cabin Lake/Silver Lake Deer Winter Range Cooperative Seasonal Vehicle Closure area located in north Lake County (Map R-7; SMA-24). The impacts would be similar to Alternative C. The Northern Wildlife Area would be expanded to coincide with the boundary of the North Lake Special Recreation Management Area. Vehicles would be restricted to existing or designated roads and trails in the northern portion of the planning area. Small areas would be closed to vehicle access (Map R-7). A number of roads would be closed within SMA's (Table 4-4, Maps SMA-5 to SMA-31). These restrictions would have both negative and positive effects on dispersed recreation activities. Public and Tribal access would be restricted for motorized recreation and other activities, but nonmotorized recreationists would have a greater opportunity to experience solitude. There would be greater negative effects compared to Alternative A or B, but less than Alternative C.

### ***Alternative E***

Impacts to recreation from actions to protect, restore, or enhance watershed functions, riparian/wetland areas, upland vegetative communities, and wildlife habitats and populations would be similar to Alternatives A–D. Natural process would be allowed to regulate (e.g., fire) forest health and biodiversity. There would be no impacts to recreation.

All existing ACEC's designations would be revoked and no new ACEC's would be designated. The effects would be less than Alternatives C and D and similar to Alternatives A and B.

Impacts from actions taken to protect cultural resources would be similar to Alternatives A–D.

No special recreation permits would be issued, which would eliminate all commercial uses of public lands, including guided hunting, nature tours, and wilderness therapy group uses. Overall, this would significantly impact recreation because it would preclude segments of the population from using and enjoying public lands.

Actions would be taken to withdraw the entire planning area from mineral entry, as well as close the area to mineral leasing and mineral material disposal. All of these actions would have a positive effect on recreation activities. The entire planning area would be considered a right-of-way exclusion area (except for existing rights-of-way), which would have a positive effect on dispersed recreation.

Impacts to recreation relating to the Cabin Lake/Silver Lake Deer Winter Range Cooperative Seasonal Vehicle Closure area in north Lake County would be the same as Alternatives A and B. Restricting vehicle use to existing roads and trails throughout most of the planning area would have impacts on public and Tribal access and recreational uses similar to Alternative C.

### ***Summary of Impacts***

Alternative A allows for dispersed and developed recreation opportunities while protecting other resources. Developed recreation sites would be maintained and expanded as necessary, to meet increasing demands for recreation activities. Protection of special status plant and animal species and their habitats could negatively impact dispersed recreation through future area or road closures on a limited, case-by-case basis. The management goal for recreation resources would be met under this alternative.

With the exception of several site-specific management actions, impacts to recreation resources from Alternative B would be similar to Alternative A. Revocation of the mineral segregation on the Public Sunstone Area would have significant negative effects on recreational collection of sunstone by the public. Impacts associated with wilderness therapy groups operating within north Lake County would potentially decrease slightly because total authorized user days would be capped at 8,300 annually.

Impacts to recreation uses under Alternative C would increase slightly in comparison to Alternatives A and B. Changes in OHV designations for the protection of wildlife, i.e., seasonal road restrictions on motorized access because of the mule deer winter range and the Northern Wildlife Area, would change the composition of dispersed recreation from motorized to nonmotorized. This would have both negative (to motorized recreation) and positive (greater opportunities for solitude) effects on recreation uses. Impacts associated with wilderness therapy groups would be less than both Alternatives A and B because of the decreased number of authorized user days and because of the seasonal restrictions in the North Lake Special Recreation Management Area. Restrictions within the Lost Forest/Sand Dunes/Fossil Lake ACEC would have significant effects on recreation resources in comparison to Alternatives A, B, and D.

Overall, impacts to recreation uses under Alternative D would be less than under Alternative C and slightly higher than under Alternatives A and B. Impacts to recreation uses within the Lost Forest/Sand Dunes/Fossil Lake ACEC would be lower than under Alternative C but similar to Alternatives A and B. There would be slightly higher impacts associated with wilderness therapy school operations under Alternative D in comparison to Alternative C, but lower than Alternatives A or B.

Impacts to recreation uses under Alternative E would be the lowest of any alternative, except in relation to commercial uses and motorized access. No commercial recreational uses would be allowed throughout the planning area, which would have higher impacts than any of the other alternatives. Over 99 percent of the planning area would be designated as limited to existing roads and trails for motorized access. This would impact recreational use slightly less than under Alternative C, but would have greater impacts than in comparison to Alternatives A, B, or D.

### ***Secondary, Indirect, and Cumulative Impacts***

When taken in concert, future management actions relating other resources on lands within and adjacent to the planning area could negatively impact recreation uses. Although the population base within the boundaries of the planning area is fairly steady, urban growth and increases in populations in surrounding areas, in particular the Bend/Redmond area, would have the potential to increase recreation uses, especially within north Lake County.

## **Off-Highway Vehicles**

**Management Goal—*Manage off-highway vehicle (OHV) use to protect resource values, promote public safety, provide OHV use opportunities where appropriate, and minimize conflicts among various users.***

### ***Impacts Common to Alternatives A–D***

The frequency and extent of future off-road military, emergency, or law enforcement use in limited or closed areas is impossible to predict, but for analytical purposes is assumed to occur no more than three times per year in very small areas. The level of surface disturbance would depend on soil conditions, season of year, vegetative cover, and other factors. Wildfire, though difficult to predict, would likely occur over a much larger area. Rehabilitation actions typically occur following wildfire and could include water-barring, seeding, and other measures to mitigate impacts of firefighting actions, including off-road travel. Refer to the Fire Management section and Appendix L of the Draft RMP/EIS for more information.

The frequency and extent of future off-road use associated with authorizing exceptions for licensed, leased, permitted, contracted, or other authorized uses is also difficult to predict. The BLM is required to provide access for authorized uses such as livestock management and mineral location. However, due to the sideboards placed on granting such exceptions, impacts would be limited.

### ***Analysis of Impacts***

#### ***Alternative A***

Actions to protect, restore, or enhance watersheds, riparian/wetlands areas, upland vegetative communities, fish, wildlife and their habitats, special status plant and animal species, and forest health and biodiversity

Table 4-5.—Impacts to off-highway vehicle uses by alternative (acres)

Designation	Alternative							
	A		B		C		D	
	Baseline <sup>1</sup>	% of total <sup>2</sup>	Proposed acres	% of total <sup>2</sup>	Proposed acres	% of total <sup>2</sup>	Proposed acres	% of total <sup>2</sup>
<b>Open</b>	<u>2,508,408</u>	79.4	<u>2,504,974</u>	79.3	0	0.0	<u>1,760,352</u>	<u>55.7</u>
<b>Limited to designated roads/trails<sup>3</sup></b>	130,323	4.1	130,159	4.1	771,524	24.4	<u>384,537</u>	<u>12.2</u>
<b>Limited to existing roads/trails</b>	<u>514,142</u>	16.2	<u>517,741</u>	16.3	2,349,385	74.3	<u>1,005,729</u>	<u>31.8</u>
<b>Closed</b>	8,543	0.3	8,543	0.3	40,507	1.3	<u>10,799</u>	<u>0.3</u>
							<u>3,074,960</u>	<u>97.2</u>
							<u>19,996</u>	<u>0.1</u>

<sup>1</sup> The baseline acres represent current OHV designations in the LRA.<sup>2</sup> The percent total acres represents the percentage of designated acres as part of the total acres within the LRA.<sup>3</sup> Acreages include seasonal limitations for mule deer winter range.

would have the potential to negatively affect motorized recreation. The significance of the effects would be dependent on the intensity and duration of the proposed actions. Future management actions focusing on the protection of greater sage-grouse and habitat could have significant negative impacts on motorized recreation. Habitat important to various life stages of the greater sage-grouse occur over most of the planning area. Area and road closures would result in reduction in areas open to motorized uses. Potential negative effects relating to greater sage-grouse issues notwithstanding, it is anticipated that the negative impacts to motorized uses would not be significant because potential area and road closures would occur on a site-specific basis.

The management of existing SMA's (ACEC's, RNA's, and WSA's) negatively affects motorized recreation activities by restricting access.

Actions to protect cultural resources could negatively affect motorized uses because of potential road and area closures. Overall, these impacts would be minimal because these closures would be on a site-specific basis.

The greatest amount of public land would be open to OHV use under this alternative (Table 4-5; Map R-2 of the Draft RMP/EIS). About 642,000 acres would be limited to existing or designated roads and trails. About 8,500 acres would be closed to OHV use. These designations would not significantly restrict motorized recreation. The mule deer winter range closure in north Lake County would negatively impact motorized recreation activities, but these impacts are not significant because the closure only restricts access on a seasonal basis. Access is not restricted during hunting seasons. Snowmobile activities are negatively impacted, but the extent of the impact is dictated by the presence or lack of snowfall. The wettest periods of the year typically occur in the late fall, winter, and early spring. This is when motorized vehicles have the greatest potential to cause resource damage in open areas and roads.

The development of mineral materials, oil, gas, and geothermal leasing, and locatable minerals would have minimal negative effects on motorized recreation, and may possibly provide motorized recreational opportunities in the long term through the development of new roads and trails. In many instances, land acquisitions, the issuance of rights-of-way, leases, and permits, and the construction of roads may benefit motorized recreational activities by providing more opportunities for access.

### **Alternative B**

Actions to protect, restore, or enhance watersheds, riparian/wetlands areas, upland vegetative communities, fish, wildlife and their habitats, and special status plant and animal species would have the same level of impacts as management actions proposed under the current situation. The significance of the effects would continue to be dependent on the intensity and duration of the proposed actions. Future management actions focusing on the protection of greater sage-grouse and their habitat would have the same potential to negatively impact motorized recreation as Alternative A. Negative effects could increase slightly compared to Alternative A from management actions to enhance forest health and biodiversity. Existing and new juniper treatment areas would be maximized; up to 75 percent of early- to mid-successional western juniper stands would be treated. However, these impacts would be short term.

The management of existing and creation of one new (Connley Hills) SMA would continue to negatively affect motorized recreation activities by restricting access.

Impacts relating to cultural resource management would be similar to Alternative A. The protection of cultural resources could negatively affect motorized recreation because of potential road and area closures. Overall, these impacts would be minimal because closures would occur on a site-specific basis. The impacts of development of mineral materials, oil, gas, and geothermal leasing, and locatable minerals would be similar to Alternative A. Opportunities for increased motorized recreation could be slightly higher because of the potential for increased mineral development, especially in the long term. The impacts of issuance of rights-of-way, leases, and permits would be similar to Alternative A. With greater emphasis on acquisition of lands with high recreational values, motorized recreation would potentially be enhanced compared to Alternative A.

There would be a slight net loss of 3,434 acres (0.1 percent) under the open designation compared to Alternative A (Table 4-5). The number of acres limited to existing or designated roads and trails would increase about 3,434 acres. The impacts of the mule deer winter range closure in north Lake County would be the same as Alternative A. The impacts of limited, site-specific areas and road closures would be similar to Alternative A. The overall impact to motorized recreation would be similar to Alternative A.

### Alternative C

Actions to protect, restore, or enhance watersheds, riparian/wetlands areas, upland vegetative communities, fish, wildlife and their habitats, and special status plant and animal species would have little effect on OHV use because none of the planning area would be designated as open.

The management of existing and creation of new SMA's would negatively affect motorized recreation activities by restricting access.

Impacts relating to cultural resource management would be similar to Alternatives A and B.

The use of all-terrain vehicles in conjunction with the collection of deer and elk antlers in north Lake County (including the expanded Cabin Lake/Silver Lake Deer Winter Range Cooperative Vehicle Closure area and the proposed Northern Wildlife Area) has been increasing in popularity over the past several years. With motorized access limited to designated or existing roads and trails, this activity would only be allowed on foot or horseback. However, there would be a benefit to this restriction because there could be a corresponding decrease in impacts from the use of all-terrain vehicles which cause rutting and soil erosion, especially during wet conditions, the trampling of vegetation, and conflicts with wildlife, including big game animals and greater sage-grouse. The use of motorized vehicles to retrieve big game during the hunting season would be eliminated throughout the planning area. This would have a significant negative impact on hunters, especially for elderly hunters and those with physical disabilities.

There would be no open designation for motorized use (Table 4-5). The negative impacts to motorized recreation in comparison to Alternatives A and B would be significant. Motorized access would be restricted to either a limited designation (24.4 percent designated roads and trails and 74.3 percent existing roads and trails) or closed (1.3 percent). Although the percentage of total acres closed would only increase by approximately one percent in comparison to Alternatives A and B, the Sand Dunes WSA would be included in these closures. The Sand Dunes WSA receives the highest OHV recreational use throughout the entire planning area. Closure of this area, in conjunction with 99 percent of the area designated as either limited to existing or designated roads and trails, would severely curtail motorized recreation uses. The impacts of road closures (Table 4-4) would further impact motorized vehicle use.

The impact of development of mineral materials, oil, gas, and geothermal leasing, and locatable minerals, as well as the issuance of rights-of-way, leases, permits, or the acquisition of lands would be similar to Alternatives A and B.

### Alternative D

Actions to protect, restore, or enhance watersheds, riparian/wetlands areas, upland vegetative communities, fish, wildlife and their habitats, and special status plant and animal species would have impacts similar to Alternatives A and B. The significance of the effects would be dependent on the intensity and duration of the proposed actions. Negative effects related to management actions to enhance forest health and biodiversity would be similar to Alternatives A and B, and less than Alternative C. It is anticipated that the impacts would be short term. Future management actions focusing on the protection of greater sage-grouse and habitat would have the same potential to negatively impact motorized recreation as Alternatives A and B.

The management of existing and creation of new SMA's would negatively affect motorized recreation activities by restricting access to a similar degree as Alternative C.

Impacts to OHV uses relating to cultural resources would be similar to those addressed under Alternatives A–C.

The percentage of land in the open designation (55.7 percent) would be lower than Alternatives A and B and higher than Alternative C (Table 4-5). Motorized vehicle use would be limited to existing or designated roads and trails on about 44 percent of the area. The impacts of the addition to the Cabin Lake/Silver Lake Deer Winter Range Cooperative Vehicle Closure area would be similar to Alternative C (Map R-7, SMA-24). Vehicles would be seasonally limited to designated roads and trails from December 1 through March 31, annually. During the remainder of the year, this area would be limited to existing roads and trails. Motorized access within the North Lake Special Recreation Management Area would be limited to existing roads and trails, similar to Alternative C. The impacts to motorized uses in the northern part of the planning area would be similar to Alternative C and greater than Alternatives A and B. The impacts of road closures (Table 4-4; Maps SMA-5 to SMA-31) would further impact motorized vehicle use.

The impacts of development of mineral materials, oil, gas, and geothermal leasing, locatable minerals, as well

as the issuance of rights-of-way, leases, permits, or the acquisition of lands would be similar to Alternatives A, B, and C.

### **Alternative E**

Management actions relating to upland vegetative communities, fish, wildlife, and their habitats, and special status plant and animal species would have little or no impacts on motorized recreation. Future management actions focusing on the protection of greater sage-grouse and habitat would have the same potential to negatively impact motorized recreation as Alternatives A–D because of possible road closures.

The entire planning area would be designated as limited to existing roads and trails. Impacts to motorized recreation would be similar or slightly less than Alternative C. The designation of limited to existing roads and trails would essentially close Sand Dunes WSA to most vehicle use. Alternatives A, B, and D would be less-impacting in comparison to Alternative E. No organized OHV events would be authorized under Alternative E. This would be a greater impact than under the other alternatives (because OHV events would not be restricted).

### **Summary of Impacts**

Common to all alternatives, future management actions which would focus on the protection of greater sage-grouse and their habitat could restrict motorized recreation. The significance of the impacts would be dependent on the scope of the area or road closures which could be initiated.

Alternative A provides for the highest percentage of public land that would be open to OHV uses (79.4 percent). Collectively, the limited and closed designations would not significantly restrict motorized recreation. The impacts of Alternative B would be very similar to Alternative A.

Alternative C would have much greater impacts than either Alternatives A or B. None of the planning area would be under the open designation, while approximately 99 percent would be under a limited designation. The overall negative impacts of Alternative E would be comparable to Alternative C. Under Alternatives C and E, no motorized uses would occur within the Sand Dunes WSA.

Alternative D would have less of a negative impact on motorized recreation uses than under Alternatives C or E. With added restrictions relating to the mule deer

winter range and the North Lake Special Recreation Management Area, impacts to motorized uses would be higher under Alternative D than Alternatives A or B.

Management goals for OHV's would be best met under Alternative D. This alternative provides for the protection of resources while allowing opportunities for motorized recreation uses, including the Sand Dunes, which receives the highest density of motorized use within the entire planning area.

### **Secondary, Indirect, and Cumulative Impacts**

Management actions, including past, present, and reasonably foreseeable actions, collectively, would impact motorized recreation uses and users within the planning area. Future management actions relating to the protection of potential or existing threatened, endangered, and/or sensitive plant and animal species have a high potential for negatively impacting motorized recreation uses. Future management actions relating to the protection of greater sage-grouse and their habitat would have an impact on motorized recreation uses within the planning area and other Federal lands adjacent to the planning area. However, the degree or level of these impacts is unknown at this time.

Past actions which have restricted access and/or numbers of motorized uses at popular OHV areas (e.g., the Oregon Coast, Millican Valley) result in users looking elsewhere for recreation opportunities. Uses then increase within other areas (e.g., Sand Dunes), which then results in increased user conflicts and potential resource impacts. The protection of the resources dictate increased management, which inevitably requires stricter controls on access and numbers of users.

The BLM's "National Management Strategy for Motorized Off-Highway Vehicle Use on Public Lands" (2001e) and the USFS's "Forest Service's Roadless Areas Initiative" would most certainly affect motorized recreation uses, in regard to both present and future actions proposed or enacted. The population growth that the Bend/Redmond area is experiencing would bring increased motorized recreation use in the northern part of the planning area.

## **Visual Resources**

**Management Goal—*Manage public land actions and activities consistent with visual resource management (VRM) class objectives.***

## *Analysis of Impacts*

### *Alternative A*

Actions that promote the protection of watershed functions, riparian and wetlands, fish and wildlife habitat, and upland vegetative communities would enhance the natural landscape character. Such actions could include reduced livestock grazing within riparian areas and stream bank stabilization. However, monoculture seedings, e.g., crested wheatgrass, could create an unnatural appearance within a characteristic landscape. Impacts from forest health management actions should not significantly affect visual quality if conducted on small, localized areas.

There are twelve WSA's, totaling approximately 472,768 acres, which are managed under a VRM Class I to maintain the highest level of protection for existing visual qualities. This designation would remain in effect until such time as Congress acts on designation.

With an emphasis on aggressive initial fire attack and full suppression of all wildland fires, there could be negative impacts to visual qualities. Specific actions causing adverse impacts would be from earth-moving equipment and other vehicles driving cross-country. Short-term, adverse impacts from controlled burns would not be significant if mitigation measures are followed.

The construction of new recreation sites or the expansion of existing sites would be considered if unacceptable resource degradation was occurring. It is anticipated that any such development would not significantly impact visual qualities and would reduce impacts in many cases. Negative effects could occur from OHV activities if these uses cause loss of vegetation, soil exposure, or erosion. Approximately 79 percent of the planning area is designated open, allowing cross-country vehicular travel.

Management actions relating to the development of mineral materials, oil, gas, and geothermal leasing, and locatable minerals have a high potential to change the natural character of the landscape. However, the potential for large-scale development relating to mining would be low. Mitigation measures relating to these activities (Appendix N3 of the Draft RMP/EIS) would reduce the significance of the effects.

The issuance of new rights-of-way, leases, and permits, and road construction activities would have the potential to negatively impact visual resources. Restricting future developments to designated utility corridors

would help to mitigate these impacts.

### *Alternative B*

Actions that promote the protection of watershed functions, riparian areas and wetlands, fish and wildlife habitat, and upland vegetative communities would enhance the natural landscape character. Such actions could include reduced livestock grazing within riparian areas and stream bank stabilization. The management actions would be similar to Alternative A. The overall changes in visual qualities would be similar as well. Changes to the landscape character could increase slightly compared to Alternative A from management actions to enhance forest health and biodiversity. Juniper treatment areas would be maximized; up to 75 percent of early- to mid-successional western juniper stands would be treated.

There would be no change in the VRM designations in WSA's. There would be no difference in visual qualities compared to Alternative A.

The overall impacts to visual resources relating to initial fire attack and suppression of wildland fires would not vary significantly from Alternative A. The level of prescribed burns and other fuel reduction treatments would be increased. This would raise the potential for short-term, adverse impacts to occur to visual resources, but the increase would not be significant.

Impacts from recreation would be similar to Alternative A. Negative effects from OHV activities would be similar to Alternative A.

Impacts from management actions relating to the development of mineral materials, oil, gas, and geothermal leasing, and locatable minerals would have a slightly higher potential to change the natural character of the landscape than under Alternative A, because these actions would be encouraged. However, the potential for large-scale development relating to mining would still be relatively low and existing mitigation measures (Appendix N3 of the Draft RMP/EIS) would reduce the significance of the effects from these actions.

The issuance of rights-of-way, leases, and permits, and road construction activities would have potentially the same impacts on visual resources as under Alternative A. Land acquisitions would focus on acquiring lands that would facilitate commodity production. These actions could potentially have a negative effect on visual quality on a site-specific basis.

### Alternative C

Impacts to visual resource qualities from actions that promote the protection of watershed functions, riparian areas and wetlands, fish and wildlife habitat, and upland vegetative communities would be similar to Alternatives A and B. Changes to the landscape character from management actions to enhance forest health and biodiversity would decrease slightly in comparison to Alternative B, because there would be a decrease of 25 percent in the amount of early- to mid-successional western juniper stands proposed for treatment.

The effects of VRM designations in WSA's would be similar to Alternatives A and B. Proposed ACEC designations and associated changes in VRM management class would provide more protection of visual quality on up to 180,000 acres.

The overall impacts relating to initial fire attack and suppression of wildland fires would be similar to Alternatives A and B. Reduction in fuel loads through prescribed fire, wildland fire, or other treatments are proposed for up to 640,000 acres; this level of treatment would cause a higher level of negative impacts to visual resources than Alternatives A or B. Under Alternative A, approximately 5,000–20,000 acres would be treated annually, and approximately 64,000 acres would be treated under Alternative B.

The impacts from recreation activities would be similar to Alternatives A and B. Negative effects from OHV activities would be lower than under both Alternatives A and B. The total number of acres in the open designation would decrease significantly (Table 4-5) in comparison to Alternatives A and B.

Impacts from management actions relating to the development of mineral materials, oil, gas, and geothermal leasing, and locatable minerals would be similar to Alternative A. Compared to Alternative B, there would be less potential for negative impacts because consumptive uses would not be encouraged. It is anticipated that the potential for large-scale development relating to mining would be relatively low and existing mitigation measures (Appendix N3 of the Draft RMP/EIS) would reduce the significance of the effects.

The issuance of rights-of-way, leases, and permits, and road construction activities would have potentially the same impacts on visual resources as Alternatives A and B. Land acquisitions would have potential positive impacts by focusing on lands with high resource values.

### Alternative D

Impacts to visual resource qualities from actions that promote the protection of watershed functions, riparian areas and wetlands, fish and wildlife habitat, and upland vegetative communities would be similar to Alternatives A, B, and C. Changes to the landscape character from management actions to enhance forest health and biodiversity would be similar to Alternative C.

The effects of VRM designations in WSA's would be similar to Alternatives A, B, and C. Proposed ACEC designations and associated changes in VRM management class would provide the same level of protection for visual qualities as Alternative C.

Impacts relating to initial fire attack and suppression of wildland fires would be similar to Alternatives A, B, or C. Fuel treatments (up to 480,000 acres annually) would be lower than Alternative C and higher than Alternatives A and B. Therefore, potential short-term negative effects on visual resources would be lower than Alternative C but higher than both Alternatives A and B.

The impacts from recreation activities would be similar to Alternatives A, B, and C. Negative effects from OHV activities would be similar to Alternative C.

Impacts from management actions relating to the development of mineral materials, oil, gas, and geothermal leasing, and locatable minerals would vary between Alternatives A, B, and C, but the differences would not be significant. More areas would be open to mineral leasing in comparison to Alternative C, but less in comparison to Alternative B. It is anticipated that the potential for large-scale development relating to mining would be relatively low and existing mitigation measures (Appendix N3 of the Draft RMP/EIS) would reduce the significance of the effects.

The issuance of rights-of-way, leases, and permits, and road construction activities would have potentially the same impacts as Alternatives A, B, and C. Land acquisition impacts would be the same as Alternative C.

### Alternative E

The effects of VRM designations in WSA's would be similar to Alternatives A, B, and C. No ACEC's would be designated, so visual qualities within these areas would not receive the added protection, as under Alternatives C and D. All VRM designations in the

remainder of the planning area would be revoked and natural processes would be allowed to determine visual quality.

Commodity uses such as mining, grazing, commercial wood cutting, and other commodity uses would not be allowed. The potential for negative impacts in comparison to all of the other alternatives would be reduced significantly.

Negative impacts relating to initial attack and fire suppression would be higher than Alternatives A, B, C, or D because there would be a minimal level of time or resources used for these actions. However, fuel treatments would not occur, and the short-term impacts to visual qualities would be the lowest of all the alternatives.

Impacts from recreation uses would be minimized compared to all other alternatives. Site rehabilitation or closure would be the primary management action taken to prevent adverse impacts to visual qualities. Potential impacts from OHV uses would be lower than under any other alternative. The entire planning area would be limited to travel on existing roads and trails only.

### **Summary of Impacts**

The management goals for visual resources could be met under all of the alternatives. With the exception of Alternative E, there would be potential for negative impacts to occur on a site-specific basis from such things as proposed development, grazing, woodland treatments, OHV use, mining, recreation activities, and fire suppression activities. However, by following BMP's and mitigation (Appendices D and N3) for specific projects, the degree or level of negative impacts on visual resources would be minimized.

The greatest protection for visual resources would occur under Alternative E. Alternative B would have the greatest potential for negatively impacting visual resources. Overall, Alternatives C and D are similar in terms of the potential for negatively impacting visual resources. Alternatives C and D would provide a greater level of protection for visual resources than Alternatives A and B.

### **Secondary, Indirect, and Cumulative Impacts**

With the western United States experiencing increases in population, there is a corresponding increase in the potential for proposed development, commodity uses, recreation activities (motorized and nonmotorized), and

the continuation of existing uses, such as grazing. It is not anticipated that these increases and other uses and activities would cumulatively have significant negative impacts on visual resources. Following BMP's and mitigation (Appendices D and N3) for individual projects, the overall effects or level of negative impacts on visual resources would be minimized.

## **Energy and Mineral Resources**

### ***Assumptions***

The allocations and management prescriptions for other resource programs affect availability of land for exploration and development of energy and mineral resources differently throughout the alternatives. Operating constraints on locatable, leasable, and salable mineral activity vary from area to area across these alternatives.

Future trends and assumptions, along with 15- to 20-year energy and mineral development scenarios for the planning area, are discussed in detail in Appendix N2. It is assumed that the same level of interest in mineral exploration and development would be the same through all of the alternatives.

To assess the effects of various resource allocations and management prescriptions through the alternatives, constraints have been divided into four categories: (1) closures, including withdrawals; (2) no-surface-occupancy (for leasable minerals); (3) standard requirements or lease terms, and (4) additional restrictions, such as seasonal operating and controlled surface use constraints. The closures are further divided into discretionary (under the control of BLM) and nondiscretionary (imposed by law, regulation, Secretarial decision, or Executive order). Tables 3-7 and 4-6 show, by alternative, the acres of mineral estate of high, moderate, and low/unknown mineral potential available for, as well as restricted from, mineral exploration and development.

**Management Goal 1—*Provide opportunity for the exploration, location, development, and production of locatable minerals in an environmentally-sound manner. Eliminate and rehabilitate abandoned mine hazards.***

Table 4-6.—Acres of mineral restrictions within areas of high and moderate mineral potential<sup>1</sup>

Mineral restrictions	Alternative A			Alternative B			Alternative C			Alternative D			Alternative E		
	High	Moderate		High	Moderate		High	Moderate		High	Moderate		High	Moderate	
<b>Leasable minerals</b>															
Closed	41,268	440,199		41,269	439,314		41,347	520,041		41,315	443,439		114,309	2,708,184	
NSO or other	59,524	1,071,171		59,523	1,068,605		81,770	2,201,725		<u>66,751</u>	<u>1,269,207</u>		0	0	
<b>Locatable minerals</b>															
Closed	2,611	4,678		0	4,347		21,614	166,600		2,632	6,014		25,245	268,224	
NREC or other	2,719	191,301		2,719	191,633		1,236	91,598		<u>7,370</u>	<u>193,632</u>		0	0	
<b>Salable minerals</b>															
Closed	41,418	558		41,418	558		43,473	1,087		<u>41,148</u>	510		44,138	1,154	
Other	1,468	203		1,468	203		660	64		<u>1,268</u>	<u>332</u>		0	0	

<sup>1</sup> These acre values are for areas of Federal mineral ownership only.

## *Analysis of Impacts*

### *Alternatives A and B*

These alternatives provide the most land available for locatable mineral exploration and development with the fewest restrictions, with Alternative B being less restrictive than Alternative A. Under Alternative A, 10 percent of high-potential and 2 percent of moderate-potential locatable mineral lands would be closed, while 11 percent of high-potential and 71 percent of moderate-potential locatable mineral lands would be open subject to additional restrictions (Table 4-6).

Under Alternative B, 0 percent of high-potential and 2 percent of moderate-potential locatable mineral lands would be closed, and 11 percent of high-potential and 71 percent of moderate-potential locatable mineral lands would be open subject to additional restrictions. The Public Sunstone Collecting area would be open to mineral entry, which would make an additional 2,440 acres of high-potential sunstone ground available for mining claim location. An increase of up to 122 mining claims would be anticipated. This could equate to 122 new, small sunstone operations or a few new large ones. The public would not be able to collect sunstones without the permission of the mining claimants.

### *Alternative C*

Except for Alternative E, this alternative would be the most restrictive to the exploration and development of mineral resources. Compared to Alternatives A and B, there would be less land available for mineral exploration and development and more restrictions on lands that remain open. About 86 percent of high-potential and 62 percent of moderate-potential mineral lands would be closed. About 5 percent of high-potential and 34 percent of moderate-potential mineral lands would be open, subject to additional restrictions (Table 4-6).

### *Alternative D*

This alternative would provide for more mineral-related opportunities than Alternative C, but less than Alternative B. About 10 percent of high-potential and 2 percent of moderate-potential mineral lands would be closed. About 29 percent of high-potential and 72 percent of moderate-potential mineral lands would be open subject to additional restrictions (Table 4-6; Map M-10).

### *Alternative E*

This would be the most restrictive of all of the alternatives. The entire planning area (100 percent) would be withdrawn from locatable mineral entry (Table 3-7).

### *Summary of Impacts*

For locatable minerals, Alternative B, followed closely by Alternative A, would close or restrict the least amount of public land to locatable mineral exploration/development and therefore, would offer the greatest opportunity for these activities. Alternative E would close the entire area. The remaining alternatives would be intermediate in their overall effects to locatable mineral activity.

**Management Goal 2—*Provide leasing opportunity for oil and gas, geothermal energy, and solid minerals in an environmentally-sound manner.***

## *Analysis of Impacts*

### *Alternatives A and B*

These alternatives provide the most land available for leasable mineral exploration and development with the fewest restrictions, with Alternative B being less restrictive than Alternative A. Under Alternative A, 36 percent of high-potential and 16 percent of moderate-potential fluid and solid leasable mineral lands would be closed due to WSA status, and 52 percent of high-potential and 40 percent of moderate-potential lands would be open subject to the no-surface-occupancy or other stipulations due primarily to sensitive wildlife habitat, visual quality, or cultural sites (Table 4-6).

Under Alternative B, 36 percent of high-potential and 16 percent of moderate-potential fluid and solid leasable mineral lands would be closed due to WSA status, and 52 percent of high-potential and 39 percent of moderate-potential lands would be open subject to the no-surface-occupancy or other stipulations due primarily to sensitive wildlife habitat, visual quality, or cultural sites (Table 4-6). This would be a minimal impact to the exploration and development of leasable minerals.

### *Alternative C*

Except for Alternative E, this alternative would be the most restrictive to the exploration and development of leasable mineral resources. Compared to Alternatives A and B, there would be less land available for mineral

exploration and development, and more restrictions on lands that are open. About 36 percent of high-potential and 19 percent of moderate-potential mineral lands would be closed due to WSA status. About 72 percent of high-potential and 81 percent of moderate-potential mineral lands would be open subject to the no-surface-occupancy or other stipulations due primarily to sensitive wildlife habitat, visual quality, or cultural sites (Table 4-6). This would significantly reduce the amount of land available for exploration and development.

#### **Alternative D**

This alternative would provide for more leasable mineral-related opportunities than Alternative C, but less than Alternatives A and B. About 36 percent of high-potential and 16 percent of moderate-potential fluid and solid leasable mineral lands would be closed due to WSA status, and 58 percent of high-potential and 47 percent of moderate-potential mineral lands would be open subject to no-surface-occupancy and other stipulations due primarily to sensitive wildlife habitat, visual quality, or cultural sites (Table 4-6; Map M-9).

#### **Alternative E**

This would be the most restrictive of all of the alternatives. Mineral leasing would not be allowed in the entire (100 percent) planning area (Table 3-7).

#### **Summary of Impacts**

Impacts to leasable mineral resources range from minor to extreme. Alternative B, followed closely by Alternative A, would close or restrict the least amount of public land to leasable mineral exploration and development and therefore, would offer the greatest opportunity for these activities. Alternative E would close the entire area. The remaining alternatives would be intermediate in their overall effects to leasable mineral activity.

**Management Goal 3—*In an environmentally-sound manner, meet the demands of local, state, and Federal agencies, and the public, for mineral material from public lands.***

#### **Analysis of Impacts**

##### **Alternatives A and B**

These alternatives provide the most land available for

salable mineral exploration and development with the fewest restrictions. Under both Alternatives A and B, 94 percent of high-potential and 48 percent of moderate-potential mineral lands would be closed due primarily to WSA status, greater sage-grouse leks, sensitive plants, and cultural sites. About 3 percent of high-potential and 9 percent of moderate-potential lands would be open, but subject to other restrictions due primarily to sensitive wildlife and visual quality (Table 4-6). Opening the Devils Garden to salable mineral disposal would be a significant positive impact on the availability of decorative stone such as slab lava, should the area be released from wilderness study by Congress.

##### **Alternative C**

Except for Alternative E, this alternative would be the most restrictive to exploration and development of mineral material resources. Compared to Alternatives A and B, there would be less land available for salable mineral exploration and development and more restrictions on lands that are open. About 98 percent of high-potential and 94 percent of moderate-potential salable mineral lands would be closed due primarily to WSA status, greater sage-grouse leks, sensitive plants, and cultural sites. About 1 percent of high-potential and 6 percent of moderate-potential lands would be open, but subject to other restrictions due primarily to sensitive wildlife and visual quality (Table 4-6). This would be a significant reduction in the availability of salable mineral material sites.

##### **Alternative D**

This alternative would provide for more salable mineral opportunities than Alternative C, but less than Alternative B. About 91 percent of high-potential and 44 percent of moderate-potential salable mineral lands would be closed due primarily to WSA status, greater sage-grouse leks, sensitive plants, and cultural sites. About 91 percent of high-potential and 44 percent of moderate-potential lands would be open, but subject to other restrictions due primarily to sensitive wildlife and visual quality (Table 4-6; Map M-8). The amount remaining open would meet public demand.

##### **Alternative E**

This would be the most restrictive of all of the alternatives. All of the planning area (100 percent), including existing pits and quarries, would be closed (Table 3-7). The disposal of salable minerals would be allowed only for critical road construction and in case of emergencies, such as flood or erosion control.

### ***Summary of Impacts***

Impacts to salable mineral resources range from minor to extreme. Both Alternatives A and B would close or restrict the least amount of public land to salable mineral exploration and development and therefore, would offer the greatest opportunity for these activities. Alternative E would close the entire area. The remaining alternatives would be intermediate in their overall effects to mineral activity.

### ***Secondary, Indirect, and Cumulative Impacts***

The most favorable condition for exploration and development of mineral resources would occur with as few restrictions as possible. Individuals and companies involved in exploration and development face numerous environmental obligations to comply with standard requirements and lease and sale terms. Any additional measures for mitigation of disturbance to lands and nonmineral resources bring about even greater impacts to mineral exploration and development. Compliance with applicable environmental laws and regulations can add costs and delays, resulting in adverse effects to exploration and mining that cannot be avoided. The imposition of discretionary mitigation measures generally adds more costs to mineral exploration and development, thereby increasing the adverse effects to these programs. No-surface-occupancy stipulations may be appropriate for small areas where directional drilling may be feasible (up to 0.5 miles). For large areas covering many square miles, such as the proposed Rahilly-Gravelly ACEC and existing Abert Lake ACEC, no-surface-occupancy stipulations effectively close the area to mineral operations. In addition, seasonal restrictions could result in access times being too short for effective exploration and development. When one considers land currently closed to mineral operations, such as wildlife refuges, military withdrawals, and new special management proposals that restrict or preclude mineral operations such as WSA's and ACEC's, it is clear that cumulative impacts would be significant under the more restrictive alternatives.

Numerous mining notices, plans of operation, and occupancies could occur in the sunstone area. With every additional notice/plan/occupancy, impacts to the vegetation, wildlife, and visual resources of the area increase. Due to the open nature of the landscape, this area is visible for considerable distances. As the number of occupancies increase, the area could become noticeable from viewpoints on Hart Mountain and along other vantage points. In addition, the accumulation of impacts from these mining-related activities, grazing, and recreation could be substantial. It is

difficult to project the actual number of acres that would be impacted from all of these activities. However, in 20 years the total cumulative surface disturbance from exploration, mining, and occupancy combined could reach 660 acres. Because of concurrent reclamation, it is unlikely that more than 160 acres of unreclaimed surface disturbance would exist at any given time.

The planning area would be open to mineral entry under Alternatives A–D. As long as the prospector/miner met the requirements of the general mining laws and “Federal Land Policy and Management Act” (FLPMA) and the relevant regulations, exploration, mining, and occupancy could not be denied. Compliance with relevant laws, regulations, restrictions imposed by the preferred Alternative D, and implementing appropriate mitigating measures (Appendices D and N3 of the Draft RMP/EIS), would minimize cumulative adverse impacts.

Some irreversible and irretrievable commitment of resources would occur and include the amounts of mineral commodities removed, such as sand, gravel, perlite, decorative stone, sunstones, and diatomite. Geothermal energy (heat) is a renewable resource that, over time, is replenished by the decay of radioactive minerals and heat-producing chemical reactions.

## **Lands and Realty**

**Management Goal 1—*Retain public land with high public resource values. Consolidate public land inholdings and acquire land or interests in land with high public resource values to ensure effective administration and improve resource management. Acquired land would be managed for the purpose for which it was acquired. Make available for disposal public land within Zone 3 by State indemnity selection, private or state exchange, “Recreation and Public Purpose Act” lease or sale, public sale, or other authorized method, as applicable.***

### ***Assumptions***

The Lands and Realty program is a support function for other resource programs. Consequently, impacts to the program are a direct result of the management emphasis of other resource programs. Land tenure actions would be directed to a point ranging from fully developing commodities to preserving natural values as dictated by other resource programs.

Lands being considered for disposal are placed in Zone 3 and are specifically identified, by alternative, on Maps L-1, -3, -4 of the Draft RMP/EIS, L-5, and Appendix O2. Contingent upon site-specific NEPA analysis and inventory for sensitive resource values, any of the land identified as suitable for disposal could be transferred from Federal ownership. Disposal would usually be by exchange or sale; however, the preferred method of disposal would be by exchange. Any acquired land or acquired interest in land would be managed for the purpose for which it was acquired or in the same manner as adjacent or comparable public land.

None of the alternatives would result in significant, net changes in Federal ownership patterns due to the tax base equalization requirements of the 1992 "Interior Appropriations Act."

### ***Analysis of Impacts***

#### ***Alternative A***

Land sales would be limited to those parcels identified in existing management framework plans (approximately 42,500 acres; Map L-1 of the Draft RMP/EIS). Land sales could increase county(s) tax revenues by adding land to the tax rolls and could increase management flexibility in resolving situations involving survey errors and hiatuses and unauthorized uses. Land tenure adjustment by exchange would be allowed when there would be no significant resource conflict on the selected BLM-administrative parcels and the offered lands possess desirable resources. An emphasis on acquiring land with high resource values, such as lands within WSA's or ACEC's, threatened or endangered species habitat, riparian or wetland areas, etc., would be of primary consideration.

Management of special status species, either plant or animal, could limit or eliminate certain disposals and exchanges. Proposed land tenure adjustments may not be allowed in order to protect special status species habitat. Proposed land tenure adjustments may not be carried out in order to retain high value habitat in Federal ownership.

Proposals involving the consolidation of split-estate would be considered on a case-by-case basis. Actions that dispose of isolated, difficult to manage parcels and acquire inholdings or other parcels that "block up" large areas would improve overall management efficiency.

#### ***Alternative B***

The major emphasis of land tenure adjustment would be for commodity production. Decisions to retain or dispose of public land or to acquire private land would be based on the opportunity to enhance commodity production. Exchanges may not result in the acquisition of land possessing high public resource values. In some cases, resource values (i.e., riparian and wildlife habitat) could be lost from public ownership if shown to benefit commodity production. Implementation of this proposal would limit disposal opportunities to approximately 54,800 acres (Map L-3 of the Draft RMP/EIS), which would be an increase above the level of Alternative A. The benefits derived from land sales would be similar to Alternative A.

#### ***Alternative C***

Impacts would be the same as Alternative A, except the major emphasis of land tenure adjustment would be retention/acquisition of land with high public resource value. Decisions to retain or dispose of public land or to acquire private land would be based on the quality of public resource values. Implementation of this proposal would reduce the disposal opportunities to approximately 7,500 acres (Map L-4 of the Draft RMP/EIS), lower than either Alternative A or B. The benefits derived from land sales would also be reduced. Under certain circumstances, disposal of small parcels of public land would be permitted in Zones 1 and 2. The consolidation of split-ownership surface and subsurface estates would be pursued on a case-by-case basis to facilitate more efficient and effective management of public land.

#### ***Alternative D***

The impacts would be the same as Alternative C, except the main emphasis for land tenure adjustment would be to protect and improve natural values while providing commodity production (Map L-5).

#### ***Alternative E***

Public land would be retained and only considered for disposal on a case-by-case basis.

### ***Summary of Impacts***

Management goals would be achieved under all alternatives except Alternative E. Land sales opportunities would be greatest in Zone 3 under Alternatives A and B, approximately 42,500 acres and 54,800 acres,

respectively. Exchanges and acquisitions in other land zones would be allowed to meet other resource objectives. Implementing Alternative B, land tenure adjustments would emphasize retention/acquisition of commodity producing land. Significant public resource values, such as riparian and wildlife habitat, may potentially be lost from public ownership. Under Alternatives C and D, land tenure adjustments would emphasize retention/acquisition of land high in resource value. Disposal opportunities would be greatly reduced from Alternatives A and B, which in turn would limit the potential for private land acquisition by limiting the pool of public disposal lands necessary to maintain the required public/private land ownership ratio in the planning area. Under Alternative E, there would be little to no land acquisition, and the majority of the public lands would be retained and only considered for disposal on a case-by-case basis.

**Management Goal 2—*Meet public needs for land use authorizations, such as rights-of-way, leases, and permits.***

### *Assumptions*

Section 503 of the FLPMA provides for the designation of right-of-way corridors and encourages the use of rights-of-way in common to minimize environmental impacts and the proliferation of separate rights-of-way. BLM policy encourages prospective applicants to locate their proposals within existing corridors. However, when right-of-way corridor proposals are in conflict with SMA's, such as WSA's and ACEC's, these areas should be avoided.

### *Analysis of Impacts*

#### *Alternative A*

There would be no impacts to the continued designation of existing right-of-way corridors. However, those areas identified as exclusion or avoidance areas (Map L-2 of the Draft RMP/EIS) would restrict the location of new rights-of-way and other land use authorizations.

Management of wildlife, fish, or their habitat could impact new rights-of-way and other land use authorizations. In order to protect certain habitats, rights-of-way may not be granted or may have to be rerouted, making them more costly and resulting in additional disturbance to the landscape.

Management of special status plant or animal species, and cultural and paleontological resources could place restrictions on the location of rights-of-way and other

land use authorizations. Rights-of-way may not be granted or have to be rerouted, resulting in additional disturbance to the landscape.

Management of some existing ACEC's and all WSA's as avoidance or exclusion areas, respectively, would have a minimal impact on the placement of new rights-of-way, since most of the planning area would still be open to new rights-of-way.

Managing areas as VRM Class I would eliminate the placement of rights-of-way and other land use authorizations for powerlines and pipelines, since these actions would be a visible change to the landscape. Since VRM I areas coincide primarily with existing WSA's, the location of new rights-of-way would also be excluded by the wilderness IMP (USDI-BLM 1995b). These types of activities would have to be relocated to other areas, which could result in longer lines, additional cost, and greater total disturbance to the landscape.

#### *Alternative B*

This alternative would voluntarily restrict the location of facilities if applicants are encouraged to locate within designated corridors. Centralizing could make the facilities more vulnerable to terrorist activities, but would also confine surface and visual disturbance to existing corridors and rights-of-way.

Impacts from management of special status species, cultural and paleontological resources, wildlife, fish, and their habitat would be the same as Alternative A.

There would be one additional SMA (Connley Hills) that would further restrict the location of new rights-of-way in a small portion of the planning area (Map L-6 of the Draft RMP/EIS). Two existing right-of-way avoidance areas present in Alternative A would be removed. WSA's would continue to be managed as right-of-way exclusion areas.

Management of VRM Class I areas would impact rights-of-way the same as Alternative A.

#### *Alternative C*

All linear rights-of-way for electrical transmission lines greater than 69 kilovolts, all mainline fiber optics facilities, and all pipelines greater than 10 inches would be confined to designated corridors. This would centralize all major energy-related transmission facilities, making them more vulnerable to terrorist activities, but would confine surface and visual disturbance

to existing corridors. This alternative would designate all existing electrical transmission lines, except the south corridor, identified in the “Western Utilities Corridor Study” (Western Utility Group 1993) and some county roads as rights-of-way corridors and would reduce the minimum standard corridor width to 1,000 feet (Map L-7 of the Draft RMP/EIS).

The impacts associated with management of special plant and animal species, fish and aquatic habitat, cultural and paleontological resources, and VRM Class I areas would be the same as Alternative A.

Most big game winter range and all greater sage-grouse habitat would become right-of-way avoidance areas. More existing and proposed SMA's, compared to both Alternatives A and B, would be considered right-of-way exclusion areas. This would effectively limit the location of new rights-of-way or other land use authorizations in most of the planning area to existing corridors.

#### **Alternative D**

The impacts associated with management of special plant and animal species, fish and aquatic habitat, cultural and paleontological resources, VRM Class I areas, and WSA's would be the same as Alternative A.

The overall impacts would be greater than Alternatives A or B, but less than Alternative C because greater sage-grouse breeding habitat and existing and proposed ACEC/RNA's would be considered right-of-way avoidance areas (Map L-8).

#### **Alternative E**

This alternative would not meet management goal objectives since new rights-of way would be excluded from the entire planning area.

#### **Summary of Impacts**

Alternatives A and B would be the least restrictive of all the alternatives. Alternative B would designate all existing transmission lines, except the south corridor, in the “Western Utilities Corridor Study” (Western Utility Group 1993) and some county roads as right-of-way corridors and would establish a minimum standard corridor width of 2,000 feet. Alternative C would be the most restrictive of all the alternatives, except Alternative E, which considers the entire planning area as a right-of-way exclusion area. Alternative C would include most big game winter range and all greater

sage-grouse habitat as a right-of-way avoidance area and mandates the location of all new large energy-related transmission facilities within designated corridors. It also would reduce the minimum standard corridor width to 1,000 feet. Alternative D would place all ACEC/RNA's and all greater sage-grouse breeding habitat into right-of-way avoidance areas. Under Alternative E, the entire planning area would be considered a right-of-way exclusion area. Management goals would be met under all alternatives, except Alternative E.

**Management Goal 3—*Acquire public and administrative access to public land where it does not currently exist.***

#### **Assumptions**

Section 205 of the FLPMA authorizes the Secretary of the Interior to acquire lands and interest in lands consistent with the mission of the Department of Interior and with applicable land use plans. Any acquired interest in land would be managed for the purpose for which it was acquired or in the same manner as adjacent or comparable public land. All roadways/improvements constructed as a result of the acquisition of lands or interest in lands would be subject to NEPA analysis prior to actual construction.

#### **Analysis of Impacts**

##### **Alternative A**

This action would ensure the continued access to public land for administrative purposes, thereby allowing management of resources on all parcels of public land. Constructing new roads around private lands where easement acquisition is not feasible would provide management the flexibility to create access to public lands, as necessary.

##### **Alternative B**

The emphasis would shift from providing access for administrative purposes to acquiring access to public lands high in commodity value. This would allow increased access for management, extraction, or use of commodity resources on public lands. This would emphasize constructing new roads around private lands to facilitate commodity development and would forego opportunities to access other public land with significant resource values.

### Alternative C

The BLM would acquire access where public demand and administrative need exists and construct roads around private land, if necessary, to secure access. Emphasis for access acquisition would be for the protection of natural values.

### Alternative D

Access would be acquired where public demand and administrative need exists. New roads would be constructed around private land, if necessary, to secure access. Emphasis for access acquisition would be to provide access to public lands containing high resource values.

### Alternative E

New access would only be acquired and road construction performed, as prescribed and mandated by law or for public health and safety.

### Summary of Impacts

Alternative A is a continuation of present management. Access acquisition would emphasize providing access to BLM-administrative facilities and program-related activities. Alternative B would provide for acquiring access to public lands high in commodity value. Alternatives C and D would provide for acquiring access to protect natural values and to areas containing high resource values. Alternative E would provide for acquiring no new access unless mandated by law. All alternatives would provide for the option of constructing new roads around private lands when easement acquisition is not feasible. Management goals could be met under all alternatives. However, under Alternative E, meeting the goal would be met only where access is required by law or for public safety.

**Management Goal 4—*Utilize withdrawal actions with the least restrictive measures necessary to accomplish the required purposes.***

### Assumptions

Section 204 of FLPMA gives the Secretary of the Interior the authority to make, modify, extend, or revoke withdrawals, and mandates review of existing withdrawals. The Department of the Interior Policy (DM 603) requires that: (1) all withdrawals be kept to a minimum, (2) lands shall be available for other public uses to the fullest extent possible, and (3) a current and

continuing review of existing withdrawals shall be instituted.

### Analysis of Impacts

#### Alternative A

Alternative A is a continuation of the present situation. Withdrawals have been periodically reviewed in the past and revoked when no longer needed. This practice would continue.

#### Alternative B

This alternative would revoke the most existing withdrawals and be the least restrictive and least impacting on commodity or recreation related activities. However, it would afford the least protection of those resources where withdrawal may be deemed necessary.

#### Alternative C

Most existing withdrawals would remain. Red Knoll ACEC would be proposed for withdrawal. This would render approximately 11,600 additional acres unavailable for operation under the public land and mining laws, but the area would still be available for mineral leasing.

#### Alternative D

Most existing withdrawals would remain. Partial withdrawal of the Red Knoll ACEC would render approximately 4,600 acres unavailable for operation under the public land and mining laws but would be still be available for mineral leasing.

#### Alternative E

The remainder of the planning area would be withdrawn from the public land, mining and mineral leasing laws. This alternative would provide the most protection to natural resource values.

### Summary of Impacts

In accordance with Department of Interior policy, management goals would be achieved under Alternatives A, C, and D. Alternatives B and E would be inconsistent with the management goals and Department of Interior policy. Alternative B would not allow any new lands to be withdrawn unless required by law, and would revoke all existing water reserves. Under Alternative C, the entire Red Knoll ACEC would be

withdrawn from the public land and mining laws. Under Alternative D, less than half of the Red Knoll ACEC would be withdrawn. Alternative E would withdraw the entire planning area, rendering it unavailable for operation under the public land, mining, and mineral leasing laws. This alternative would provide the most resource protection.

### ***Secondary, Indirect, and Cumulative Impacts***

Generally, the BLM and other Federal land management agencies operate under a no net loss policy in regard to land tenure adjustments. Therefore, the secondary, indirect, and cumulative impacts relative to Management Goal 1 are considered negligible. Most Federal land management agencies having land tenure adjustment programs strive to maintain the existing private/public land ownership ratio within their respective jurisdictional areas. State land management agencies may not operate under a no net loss policy, and if so, the disposal of state lands without replacement would increase the private land base within the planning area.

With the exception of Alternative E, the secondary, indirect, and cumulative impacts associated with the location of rights-of-way (Management Goal 2) would be similar for all the alternatives. Alternatives A–D would not prevent the location of new rights-of-way, but would restrict their location in certain areas to protect resource values. Excluding or avoiding certain areas from the location of rights-of-way could lessen the impact to a particular resource of high public value, but would not lessen the physical alteration of the landscape necessary to accommodate rights-of-way. The cumulative impact associated with rights-of-way would be a function of demand, the number, and acres occupied. Alternatives A–D would not affect the demand for or number of rights-of-way but only relocate the physical impact of new rights-of-way authorized. The more rights-of-way granted by land management agencies (Federal and state), as well as private easements, the more cumulative impact would occur on the landscape. Alternative E would not allow the location of new rights-of-way in the planning area, and therefore, secondary, indirect, and cumulative impacts would be negligible.

The secondary, indirect, and cumulative impacts associated with the acquisition of access rights (easements) (Management Goal 3) and the holders of such rights would include Federal and state land management agencies, as well as private entities. Alternatives A–D would not increase the demand for access acquisition but would establish the motivation for future

acquisitions. The more easements acquired, through all sources, the more potential for road construction, and consequently, the more cumulative impact to the landscape. Alternative E would only allow access rights to be acquired as mandated by law or necessary to protect public health and safety. The secondary, indirect, and cumulative impacts would be considered negligible.

The BLM is the only Federal agency with the authority to withdraw public lands (Management Goal 4); therefore, all withdrawal requests from other Federal agencies would be processed by the BLM. The level of cumulative impact associated with withdrawals would be relative to the number of acres withdrawn, the restrictiveness of the withdrawal, and the public's position on the issue. Public lands are withdrawn either to set an area aside for a specific use or to afford valuable resources additional protection. Generally, withdrawals exclude land from appropriation under the public land, mining, and mineral leasing laws. This would impact commodity production and other human-related uses of the area.

## **Roads/Transportation**

***Management Goal—Maintain existing roads on the planning area transportation plan and other roads to provide administrative or public access to public land. Construct new roads using best management practices (BMP's) and appropriate mitigation to provide administrative, permitted, and recreational access as needed. Close roads that are not longer needed or that are causing resource damage.***

### ***Assumptions***

- Based on past and present road maintenance budgets, approximately 100 miles of roads would be maintained each year, regardless of the alternative.
- Not all roads on the transportation plan would be maintained over the life of the plan.

### ***Analysis of Impacts***

#### ***Alternative A***

The continuation of existing management would have no impact on the maintenance of existing roads. An average of approximately 100 miles of roads would continue to be maintained each year. The total number

of miles actually maintained annually would be based on the amount of funding received in the road maintenance budget. Roads not maintained would deteriorate, which could result in resource damage, such as erosion. Non-maintained roads could also be used less since they would be more difficult to drive, thereby providing less access to the planning area.

New roads would be constructed on a case-by-case, as-needed basis. Construction of roads around private lands to access BLM-administered lands would provide legal public and agency access. This could reduce conflicts with private landowners and reduce damage to private lands. New roads could be constructed across BLM-administered land by other land holders under a rights-of-way grant to access non-Federal land. Total new road construction would not exceed 20 miles over the life of the plan.

Roads would continue to be closed on a case-by-case basis to prevent major resource damage. Roads, trails, or ways permanently closed in the past would continue to be closed. Another 164 miles of roads and trails would continue to be seasonally closed in deer winter range (Table 4-4). This would limit motorized access primarily in some SMA's, but would be a relatively minor impact when compared to the access provided by approximately 5,000 miles of roads and trails that remain open on BLM lands within the planning area.

#### **Alternative B**

Impacts of road maintenance and new road construction would be similar to Alternative A. Priorities for maintenance would be those roads that would facilitate commodity production. Any new roads constructed on BLM-administered land, whether constructed by the BLM, another agency, or a private individual, would be constructed using appropriate BMP's (Appendix D) to protect adjacent land and resources. Total new road construction would not exceed 30 miles.

The impacts of road closures would be the same as Alternative A (Table 4-4).

#### **Alternative C**

The priorities for road maintenance would be those roads that are causing resource damage such as erosion. As a result, resource damage caused by roads would decrease. Construction of new roads around private lands to access BLM-administered lands would provide legal public and agency access. This could reduce conflicts with private landowners and reduce damage to private lands. New road construction, whether for

BLM needs or to access non-Federal land, would likely not exceed 20 miles over the life of the plan. Any new roads constructed on BLM-administered land would be constructed using appropriate BMP's (Appendix D) to protect soil, watershed, riparian areas, and other resources. New roads would not be constructed in or near riparian conservation areas. This would limit, to a small extent, the placement of new roads.

There would be a concerted effort to close unneeded roads or roads damaging other resources. As a result, road closures would be greatest under this alternative. Approximately 211 additional miles of roads and trails would be permanently closed in SMA's. A total of about 239 miles of roads and trails would be seasonally closed in mule deer winter range (Table 4-4). Roads closed but not obliterated could still be used for authorized or permitted purposes. Roads closed and rehabilitated, either naturally or artificially, would be closed to future traffic. This would limit motorized access more than Alternatives A and B, primarily in SMA's, but would be a relatively minor impact when compared to the access provided by approximately 5,000 miles of roads and trails that would remain open on BLM lands within the planning area.

#### **Alternative D**

The impacts of road maintenance, construction, and road and trail closures would be similar to Alternative C. However, new permanent road and trail closures would total about 58 miles, primarily in SMA's. Seasonal road and trail closures would total about 288 miles in mule deer winter range (Table 4-4; Maps SMA-5 to SMA-31). This would limit motorized access more than Alternatives A and B, and slightly less than Alternative C, but would be a relatively minor impact when compared to the access provided by approximately 5,000 miles of roads and trails that would remain open on BLM lands within the planning area.

#### **Alternative E**

Impacts would be minimal, since maintenance would occur only to protect human health and safety or as required by law. This criteria would apply to very few roads in the planning area. New roads would not be constructed unless required by law or to provide access to non-Federal property. Such construction would not exceed 20 miles over the life of the plan. Any new roads constructed on BLM-administered land, whether constructed by the BLM, another agency, or a private individual, would be constructed using appropriate BMP's (Appendix D) to protect soil, watershed,

riparian areas, and other resources.

Roads, trails, or ways permanently closed in the past would continue to be closed. The impacts on access would be similar to Alternative A. The permanent closure of about 5 miles of existing roads and trails (Table 4-4) would be a relatively minor impact when compared to the access provided by approximately 5,000 miles of roads and trails that would remain open on BLM lands within the planning area. With the removal of livestock grazing and range improvements, a number of unneeded roads, ways, and trails could be closed in the future.

The Fremont National Forest has an active, ongoing program of closing roads that are not needed for commercial or administrative purposes or that may be causing resource damage. This program, coupled with road closures on BLM lands, could have a significant positive impact on particular watersheds by reducing access, resulting in less compaction, less vegetation disturbance, and less erosion. These effects would be most beneficial in those watersheds shared by both the BLM and the Fremont National Forest.

### **Summary of Impacts**

Impacts would be similar under all alternatives, with the fewest impacts occurring under Alternative E and the most potentially occurring under Alternative B. Priorities for maintenance would vary across the alternatives, but would depend primarily on the annual road maintenance budget. Not all roads would be maintained over the life of the plan under any alternative. As a result, some roads could deteriorate to the point of causing resource damage or being impassable.

New road construction would be greatest under Alternative B and would not exceed 30 miles under any of the other alternatives. In Alternatives B–E, new construction would be done using appropriate BMP's (Appendix D) to protect adjacent resources.

The management goal would be met under all the alternatives except Alternative E.

Road closures would occur under all alternatives with the most miles of closure occurring under Alternative C. Most of these closures would be associated with SMA's.

### **Secondary, Indirect, and Cumulative Impacts**

Roads that are not maintained over the life of the plan because of lower priorities could deteriorate to the point that they would be impassable, thereby reducing access to some parts of the planning area. Often these types of roads eventually cause resource damage, such as erosion.

New road construction could open parts of the planning area that currently do not have access. This could result in use by recreationists that could result in wildlife disturbance, soil and vegetation disturbance, erosion, and loss of solitude in an area.